Chemical Week

December 28, 1957

Price 35 cents

Forecast '58

page 75

E P POWER
UNIVERSITY MICROFILMS INC
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A McGRAW-HILL PUBLICATION

Specify SOLVAY Chlorine and get 4-Way Service

These four services are available to you without extra cost when you specify SOLVAY Chlorine:

1 Delivery Service. SOLVAY's Chlorine production centers at Syracuse, N. Y., Moundsville, W. Va., Hopewell, Va., Brunswick, Ga. and Baton Rouge, La. – plus a network of local distribution centers – assure prompt delivery of both carload and less than carload quantities.

2 Technical Service. SOLVAY maintains a special Chlorine Section in its Technical Service Department to assist you in the use, handling, storage and in all applications of chlorine, including textiles, paper, water and sewage.

3 Safety Service. SOLVAY has pioneered the development of chlorine safety programs and equipment SOLVAY-engineered Emergency Kits for cylinders, 1-ton containers and tank cars are available to users of SOLVAY Chlorine on a purchase or loan basis. SOLVAY safety wall charts give instructions on unloading, handling and first aid.

4 Literature Service. SOLVAY has a series of technical and engineering service bulletins on chlorine that include physical and chemical properties, analysis and uses.

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Potassium Carbonate • Sodium Bicarbonate • Chloroform
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Monochlorobenzene • Para-dichlorobenzene • Hydrogen Peroxide
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Allied Chemical

SOLVAY PROCESS DIVISION
ALLIED CHEMICAL & DYE CORPORATION
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Please send me without obligation SOLVAY Technical Bulletins checked:

- ☐ #7–"Liquid Chlorine"
- ☐ #11–"Water Analysis"
- ☐ #8–"Alkalies and Chlorine in Treatment of Municipal and Industrial Water"
- ☐ #12–"The Analysis of Liquid Chlorine and Bleach"
- ☐ #14–"Chlorine Bleach Solutions"
- ☐ Please have your representative call.

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Mill scale removal by Dowell started this new plant off with a $100,000 operating profit

Here's how the management of a multi-million dollar corporation used its knowledge of chemical cleaning to start a new plant off in the right way—in the black.

Following construction, and before the plant was put on stream, Dowell was called in to remove mill scale from the following systems:

• Ammonia Compressors Suction and Discharge Piping • Engine Water-Cooling System • Engine Oil-Cooling System • Engine Jackets • Hydraulic Oil-Cooling System • Oxygen Suction and Discharge Piping • Miscellaneous Piping • Product Lines to Storage • Miscellaneous Towers

The total cost of this mill scaling was approximately $5,000. But, once in production, this plant did not have a single major shut down for maintenance caused by mill scale. The plant management credits Dowell Service with netting the plant an operating profit somewhere between 10 and 20 times the cost of the chemical cleaning. This amounted to between $50,000 and $100,000 the first year.

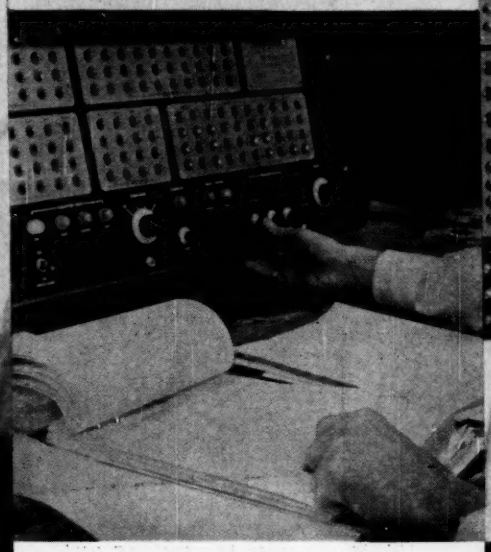
This particular case history is about a chemical company, but Dowell has startling performance data to show you—from your own industry. That's because chemical cleaning is so versatile. Dowell engineers are experts in removing scale and sludge from process systems, tanks and piping. They apply solvents in various ways—such as filling, jetting, cascading. Dowell furnishes all the necessary chemicals, trained personnel, pumping and control equipment.

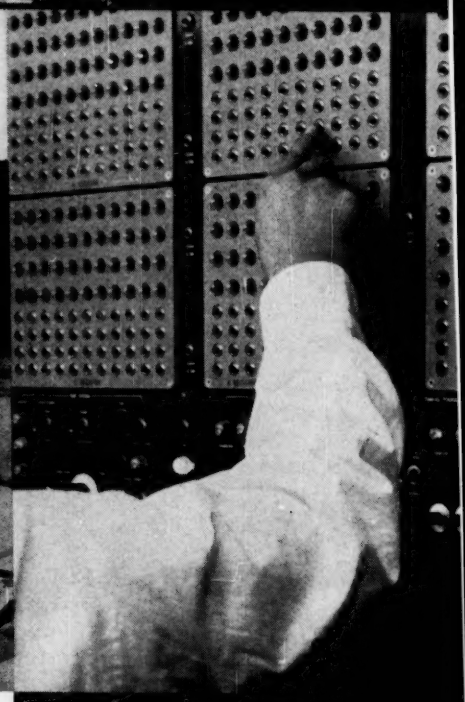
For specific information on how chemical cleaning can help you to greater profits, call the Dowell office near you. Or write Dowell Incorporated, Tulsa 1, Oklahoma.

have Dowell clean it chemically DOWELL

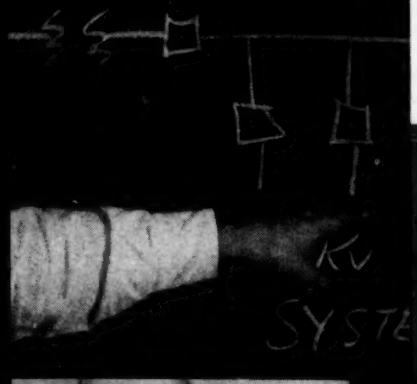
A SUBSIDIARY OF THE DOW CHEMICAL COMPANY

Fluor's Datatron digital computer frees engineers from routine computation, permitting full use of their creative design talents. Its ability to quickly perform intricate calculations without error shortens engineering lead time . . . assures maximum precision and efficiency in completed plants.





WHEN you consider expansion...
the most important investment
you can make is in
the creative ability of men.



Chemical Week

TOP OF THE WEEK

December 28, 1957

Du Pont, with just-granted product patent on linear polyethylene, now seeks licensees. But it's facing plenty of opposition from polyolefin makers ..... **p. 25**

U.S. chemical companies investing in Argentina are betting on an improving attitude toward foreign capital. Coming election will tell the story ..... **p. 27**

Temperature-indicating paints launched by oil companies' subsidiaries find prime use in refinery maintenance ..... **p. 59**

17 BUSINESS NEWSLETTER

23 OPINION

23 MEETINGS

25 BUSINESS NEWS
Polyolefin manufacturers head for battle over product patent granted to Du Pont on linear polyethylene. Du Pont offers licenses—but manufacturers are reluctant to take them.

26 Merck elevates Vannevar Bush to chairman of the board; he will take more active management role.

26 Portland Gas & Coke's swing to natural gas forces a halt in production of gas by-products.

27 Argentina's climate for foreign investments may change as result of upcoming elections. But U.S. chemical firms are betting heavily on continued goodwill.

31 WASHINGTON NEWSLETTER

35 ADMINISTRATION
Funds for organizing international chemical unions set at Atlantic City meeting of labor organizations.

43 MARKETS
Nickel supply outlook: possible excess by '60.

49 ENGINEERING
Here's how papermakers' newly installed continuous pulping processes stack up against their batch processes.

53 SALES
Planning tips show way to increase effectiveness of sales meetings.

59 PRODUCTION
Color-changing paints save high-pressure, refinery reforming equipment.

65 TECHNOLOGY NEWSLETTER

69 RESEARCH
New clinical data sheds light on how fats in diet affect health.

75 FORECAST
Facts and figures to back predictions that '58 will be a bright if not banner year.

81 COMMODITY FORECAST

93 SPECIALTIES
Max Factor bypasses "fad cosmetics" on its way to No. 3 spot in the cosmetics industry. Here's how it plans to strengthen its position.

Vol. 81
No. 26

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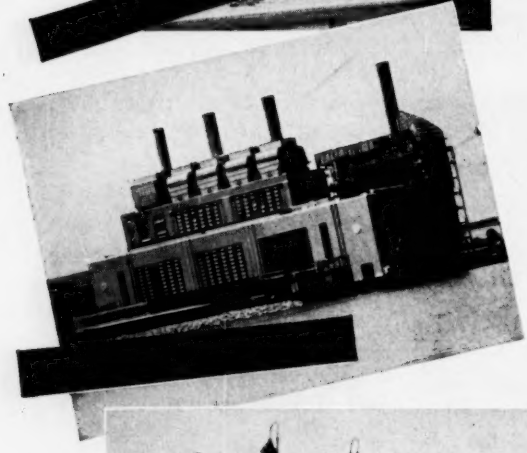

RUGGED

VOGT equipment i

One of the chief reasons why Vogt equipment is used by many of the nation's key industries is the close working operation of Vogt engineers with the customer in determini his requirements. The result is an extraordinary ability produce mechanical designs which, when translated into t finished product, most economically meet the required nee

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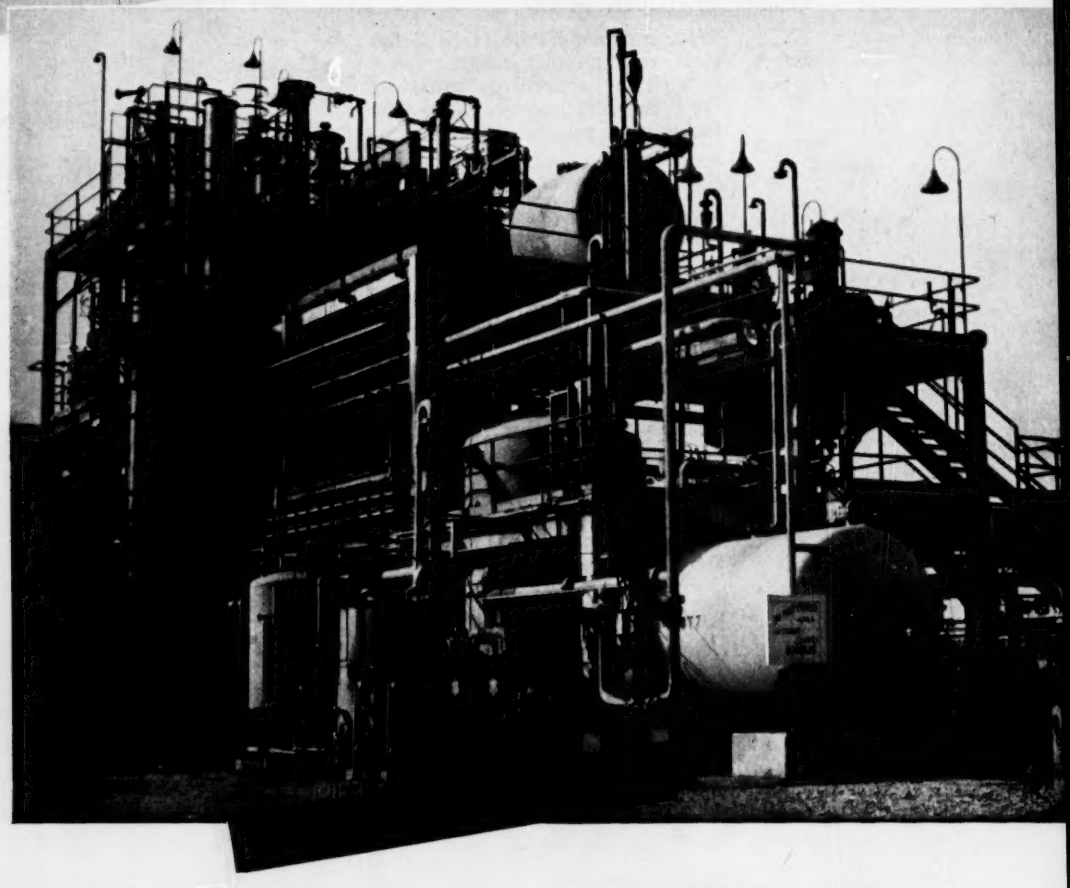
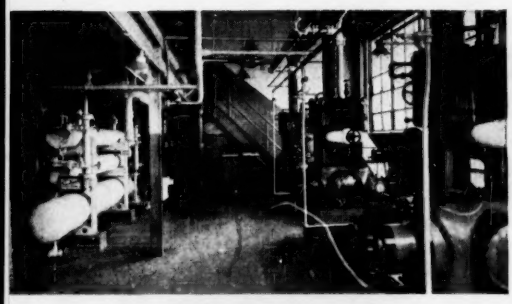


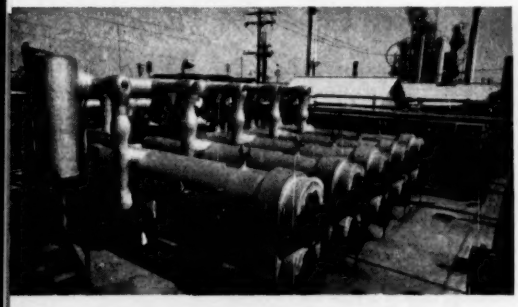
and RIGHT!

used and trusted by the nation's key industries



REFRIGERATION AND ICE MAKING EQUIPMENT

Widely employed in industry for important process work. Compression refrigeration systems, also Tube-Ice units, are available in a wide range of capacities.

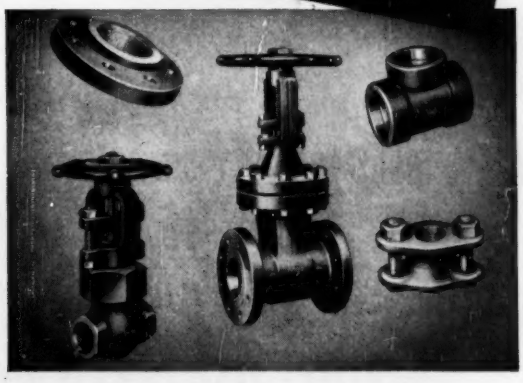


PROCESS EQUIPMENT FOR EVERY SERVICE

Constructed in wide variety to meet all Code requirements. Stills and towers, oil chillers, crystallizers, heat exchangers, molding machines, etc., serve in the manufacture of oils, greases, high octane gasoline, synthetic rubber, chemicals and related products.

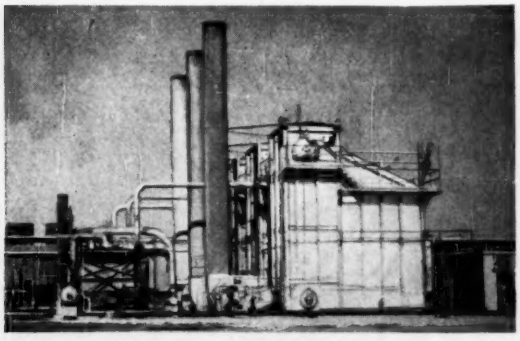
SPECIAL CORROSION RESISTANT MATERIALS

Vogt produces a wide variety of equipment from special metals and alloys to fight corrosion and product discoloration or contamination. Corrosion resistant properties of welds match that of the materials used to construct the equipment.



DROP FORGED VALVES, FITTINGS AND FLANGES

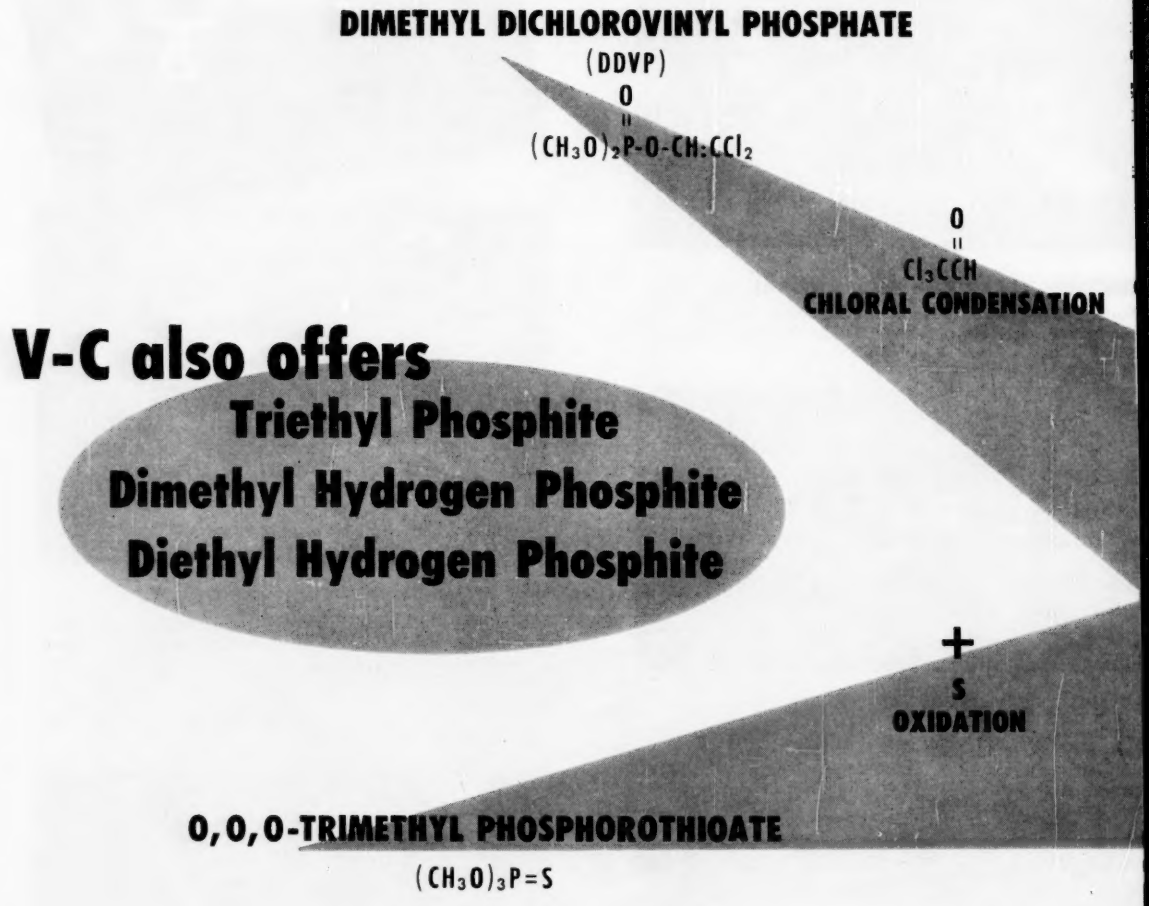
Vogt valves, fittings and flanges are drop forged from carbon and alloy steels to safely handle liquids and gases at high pressures, and high temperatures. Complete line includes: flanged, screwed and socket weld end globe, gate and check valves. Also ells, tees and crosses—couplings—bushings—plugs—unions—flanges and flange unions, and welding heads.



MODERN STEAM GENERATORS

Custom built and package type Vogt steam generators give maximum rating in a minimum of space with high efficiency and low maintenance costs. Available in bent tube and straight tube designs for solid, liquid or gaseous fuels, burned singly or in combination to meet every power, processing or heating requirement.

TRIMETHYL
VERSATILE INTERMEDIATI



V-C Trimethyl Phosphite and three other interesting intermediates offered by V-C—*Triethy Phosphite*, *Dimethyl Hydrogen Phosphite* and *Diethyl Hydrogen Phosphite* offer specia utility in the reactions shown in the diagram. Many end products applicable as insecticides plasticizers, flame retardants, specialty solvents, and lube additives can be obtained. It wi pay you to investigate these compounds. More details are yours for the asking. Just write u on your company letterhead. ***For profits and progress...see* V-C.**

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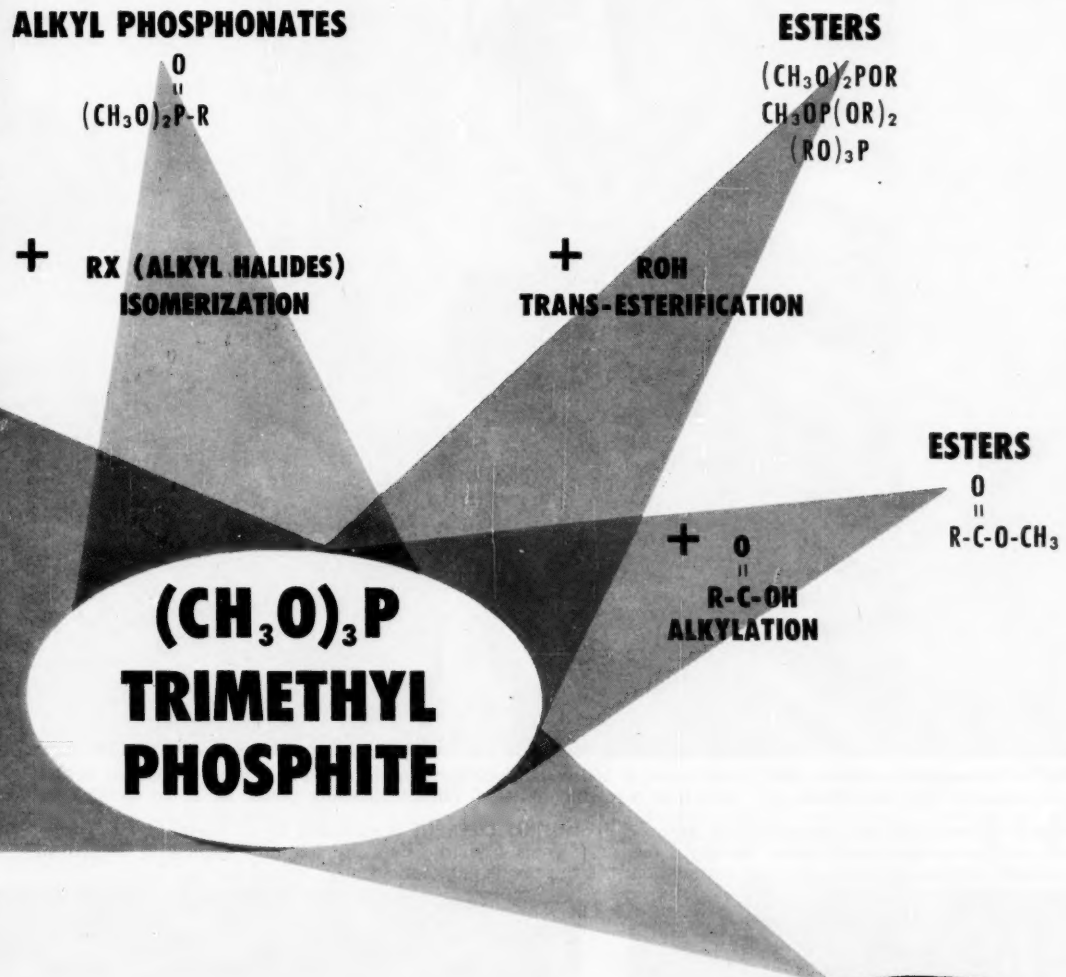

Other V-C Chemicals: In addition to organic phosphorus compounds, V-C produces elemental phosphorus, a wide range of phosphoric acids, phosphoric anhydride, a complete line of sodium phosphates, sodium metasilicate, ferrophosphorus, and other products. V-C is famous for product quality, speedy deliveries, dependable service and reliable technical assistance.

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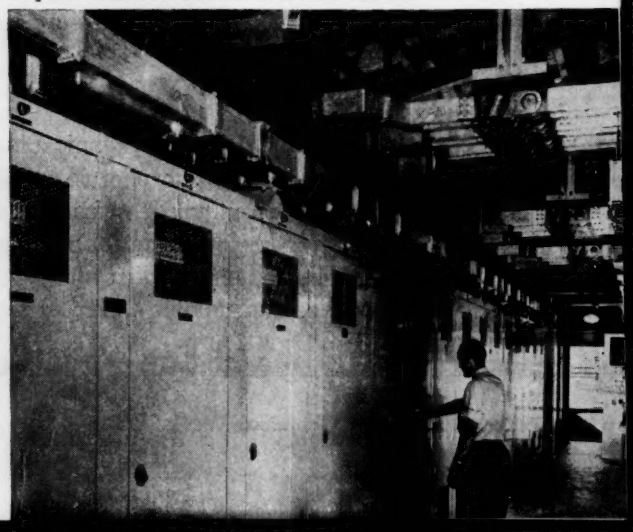
OVERHEAD METAL enclosed busway connects four rectifier transformers with rectifier compartments inside. Busway is factory-designed for high system efficiency and easy installation.

OUTPUT CURRENT is measured by d-c current transformers. Signals from d-c c-t's are fed into regulating equipment to provide automatic control of load current.



AT DOW CHEMICAL'S PITTSBURG, CALIFORNIA, PLANT . . .

NEW General Electric d-c power system improves process efficiency

G-E germanium rectifier system increases power available for chlorine-caustic electrolytic cell operation.

The Dow Chemical Company's Western Division Plant at Pittsburg, California, has improved efficiency and power available for its chlorine-caustic electrolytic cell operation. Utilization of new General Electric germanium rectifying equipment integrally designed into a co-ordinated electrical system allows automatic control of the operation's electric supply and has resulted in reduced operating costs.

Prior to the new installation of equipment, the electrolytic cell lines of similar ratings—30,000 amps at 150 volts d-c—were powered by motor-generators. Now the new system is able to provide high d-c current with an efficiency of over 95 per cent even at a low voltage. Germanium's low power loss also means that equipment necessary for cooling is kept to a minimum. Being a static device, the germanium rectifier system at the Dow plant offers the additional advantage of low maintenance. This equipment is ideally suited to such applications due to inherent high efficiency of the germanium rectifier.

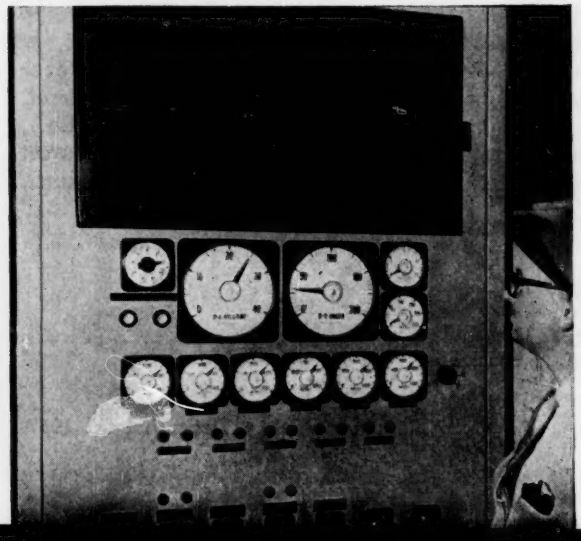
Semiconductor rectifiers of the germanium type used at Dow, or silicon type, provide efficient, highly reliable, and flexible systems for electrochemical applications.

Co-ordination of the equipment into a flexible electrical system—designed to meet this plant's special needs—resulted from close co-operation between Dow Chemical and General Electric engineers. To meet your specific power system needs, General Electric engineering services can help design, equip and install a co-ordinated electrical system from one-line diagram to on-time start-up. Early in your planning (feasibility stage), call your General Electric Apparatus Sales Office. Meanwhile, write for bulletins GEA-6375A on semiconductor power rectifiers, and GEA-6684 on semiconductor rectifier power conversion systems, to the General Electric Company, Section 662-50, Schenectady 5, N. Y.

Engineered Electrical Systems for the Chemical Industry

GENERAL ELECTRIC

EYE LEVEL operator's panel for rectifiers provides manual and automatic control, individual and total rectifier load indication, alarm and annunciator functions.



RECTIFIER SYSTEM overcurrent problems are eliminated by providing protective relays in each rectifier direct-current output circuit.

SAFE!

General American terminal keeps alcohol under "lock and key"!

Ethyl alcohol is a "problem" liquid when it comes to storage because close Federal tax supervision holds producers accountable for every gallon. A major producer who stores alcohol in General American's Carteret terminal doesn't have this problem—General American assumes it for him.

In addition to storage, the terminal provides a variety of services—metering, blending, diluting, denaturing and packaging—all provided with the necessary accountability and accuracy that solves a difficult marketing problem.

If you have a storage problem involving hard-to-handle liquids, call on General American. Leased terminal facilities give you the privacy, safety, flexibility and service of your own terminal—*without capital investment on your part.* Phone or write today. You'll find . . . *it pays to plan with General American.*

Six terminals at five key-market locations with over 14,000,000 barrels capacity: PORT OF NEW YORK (Carteret, N. J.), PORT OF NEW ORLEANS (Good Hope, La.), CHICAGO, ILLINOIS (Bedford Park), PORT OF HOUSTON (Galena Park and Pasadena, Texas), CORPUS CHRISTI, TEXAS.

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SHELL XYLENE ... has an exceptionally narrow distillation range, is slower drying than toluene.

SHELL CYCLO-SOL 53 ... an excellent solvent with higher flash point and slower evaporation than xylene. Recommended for bake finishes and flow coating.

SHELL TS-28 SOLVENT ... a still slower drying aromatic concentrate of medium high solvency. Recommended for bake finishes and flow coating.

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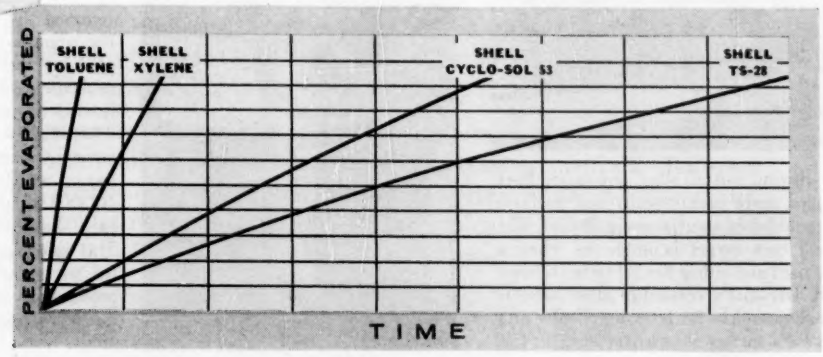

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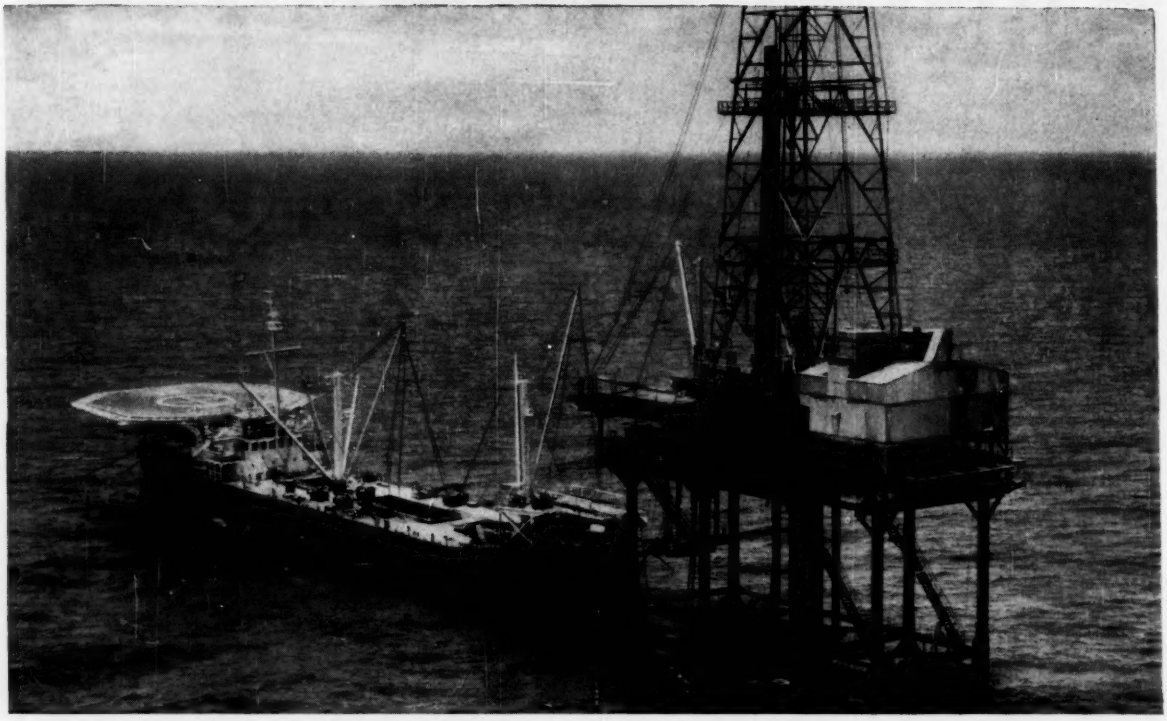

PROTECT OFFSHORE OIL WELLS—Standing in the Gulf of Mexico in water 80 to 90 feet deep, this offshore oil rig taps the vital resources of the continental shelf. Exposed to sun, rain, salt, biological organisms, and alkaline compounds used in drilling, the above water portion of the structure is protected by a five-coat paint system utilizing Napko Corporation's Durachlor System. All coatings used in this system are based on Parlon® chlorinated rubber. The offshore installation was built by Andrew Higgins Construction Company. The coating system is designed to last 25 years.

PRODUCE BETTER CARPETS—Rayon, cotton, wool, and mixed fiber carpet backings are produced more economically and perform better when Dresinol® is included in the sizing compound. The "hand" of even the lowest cost carpet is improved when a Dresinol resin dispersion is used and either flexibility or stiffness can be provided as desired. Dresinol's versatility also makes it ideal for use in modifiers and extenders for latex-base sealer and asphalt-impregnated felt in hard-surface floor coverings.

THE FLAVORING INDUSTRY

As a basic manufacturer of anethole, which is similar to oil of anise, Hercules retained the famous Gallup organization to sample consumer preferences in flavoring. Door-to-door interviews indicated that 34,000,000 adults are strongly partial to this taste while another 16,500,000 are fond of it to a slightly less degree. This information is helpful to manufacturers of products in which flavoring is an essential ingredient.

HERCULES POWDER COMPANY
INCORPORATED
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CHEMICAL MATERIALS FOR INDUSTRY

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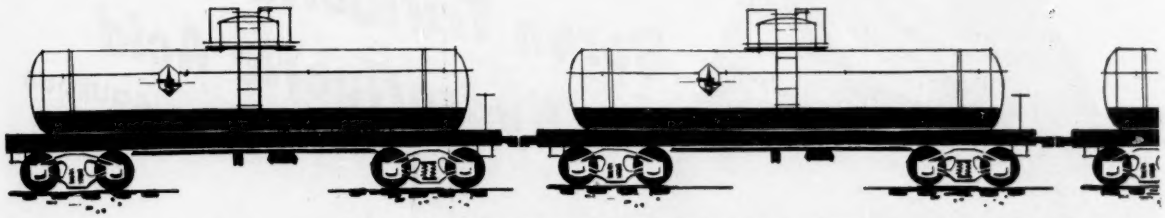
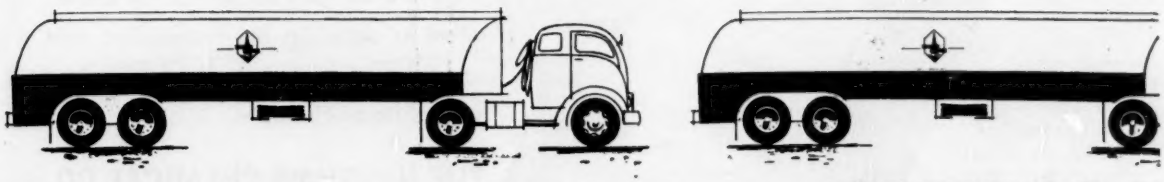


when you use JEFFERSON ethylene,



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This makes them your best buy for use as softening agents, intermediates and coupling agents. Look into the economies possible for antifreezes, heat-transfer media, production of synthetic fibers and alkyd resins, hydraulic fluids, gas dehydration, humectants, textile lubricants, and the like.

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Boron Trifluoride
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The uses for Fluorides are ever increasing. Harshaw Fluoride production also has increased steadily. Shipments of cylinders, tank trucks and tank cars leave our plant daily. If required, you are invited to draw on the knowledge and experience of our staff of technical specialists on Fluorides.

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Bismuth Fluoride
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Chromium Fluoride
Copper Fluoborate
Fluoboric Acid
Fluorine Cells
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Frosting Mixtures
Hydrofluoric Acid Anhydrous
Hydrofluoric Acid Aqueous
Hydrofluosilicic Acid
Lead Fluoborate
Metallic Fluoborates
Potassium Bifluoride
Potassium Chromium Fluoride
Potassium Fluoborate
Potassium Fluoride
Potassium Titanium Fluoride
Silico Fluorides
Sodium Fluoborate
Tin Fluoborate
Zinc Fluoborate
Zinc Fluoride

"ARCHIE" STARTED SOMETHING

The petroleum which Nature created from prehistoric creatures such as Archeopteryx (Archie) eons ago, has come to a strange and wonderful new life today. In the form of *petrochemicals*, it now plays an ever-increasing part in the great chemical industry.

Sinclair's experience — raw materials — research — technical "know-how" — well located petrochemical facilities — all are at your service. Whatever your chemical needs, whether it's established tonnage chemicals or new products just emerging from the test tube — consult us today!

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155 North Wacker Drive, Chicago, Ill.

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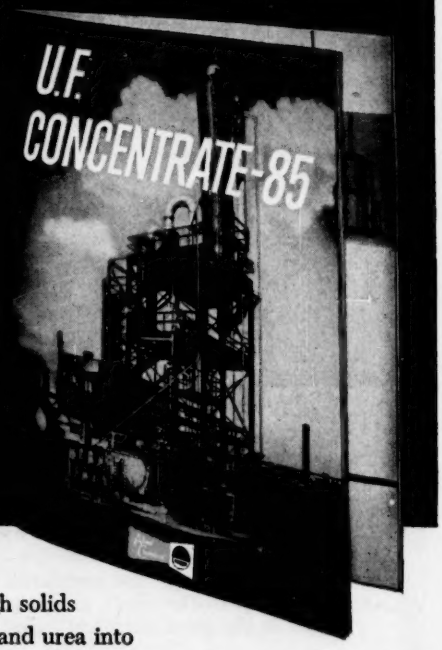
then profit by reading this book



U. F. Concentrate-85 contains 85% active raw materials—59% formaldehyde, 26% urea—and only 15% water. This high solids content enables you to charge more formaldehyde and urea into each kettle. You can increase plant capacity, using existing facilities. Write for your free copy of the new 40-page booklet on U. F. Concentrate-85 properties, applications—and economies.

Dept. UF 2-7-3

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Business Newsletter

CHEMICAL WEEK
December 28, 1957

What's the business outlook? Pretty good. Any economic slump, so far as the chemical process industries are concerned, will be limited in effect, and spotty in scope.

While a number of process companies have been talking about production cutbacks and employee layoffs, the Manufacturing Chemists' Assn. is forecasting a 5% increase in chemical company sales for '58. MCA foresees improved profit margins. And it predicts that capital investments again will exceed the $1-billion/year level that has been maintained by the chemical industry each year since '46.

Most every soft spot involves special circumstances that don't necessarily apply to the CPI in general. For example, Portland Gas & Coke Co. (Portland, Ore.) has decided to abandon its petrochemical by-products business; but the immediate reason is that its principal market—the aluminum industry of that area—has temporarily been producing at a low level.

Factors: Aluminum Co. of Canada's giant smelter at Kitimat, B.C., lost about one week's production because a rockslide in Kildala Pass snapped electric power lines to the plant. Kaiser Aluminum & Chemical Corp. is closing one of its eight aluminum potlines at Mead, Wash., "because of the uncertainty of obtaining hydroelectric power" during the current water shortage there. And recent cutbacks in defense spending also have tended to shrink aluminum output.

In manufacturing fuel gas from heavy oil, Gasco developed over the past 40 years what had been recognized as the strongest by-products business in the gas-utility industry. Products included: carbon, electrode pitch, benzene. When Gasco became primarily a natural gas distributor, following completion of the Northwest pipeline in '56, it made an intensive effort to transform its by-product operations accordingly and got as far as a "technically successful" run on a new oil stock.

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But marketing prospects for Gasco's petrochemicals are so weak, Gasco Executive Vice-President James Bell tells *CW*, that heavy operating losses would have been inevitable. "We could not expect our natural gas rate payers to underwrite such a burden," he laments.

Nevertheless, there are many strong spots in the '58 outlook for this industry. Notable instance: Thiokol Chemical Corp. (Trenton, N.J.), expecting a 50% rise in earnings next year.

Before about 150 security analysts in Philadelphia's John Bartram Hotel, Thiokol President Joseph Crosby late last week conceded that the first half of '58 might be "rather rough" for industry at large; but for his own company, he could see "no place for us but up" over the next few years.

Crosby said that military contracts—on which the company's average profit has been about 2.9%—account for about 50% of the company's earnings but about 75% of total sales. Those proportions will increase next year, with Thiokol making only modest gains in its industrial lines—e.g., synthetic rubber and polyurethane products—but expecting to do more and more rocket and missile fuel work for the U. S. government.

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As to the changing situation concerning technical manpower, Crosby tells *CW* that there's now "a ready supply" of scientists and engineers for his company's present requirements.

Another indication that U. S. industry's technical manpower needs are being met—for the present, at least—comes from the University of Texas. The university's engineering placement office reports that—for the first time in five years—companies (27, so far) have been cancelling their appointments to interview student engineers.

•

Even now, though, there's no end to industry growth, actual and potential.

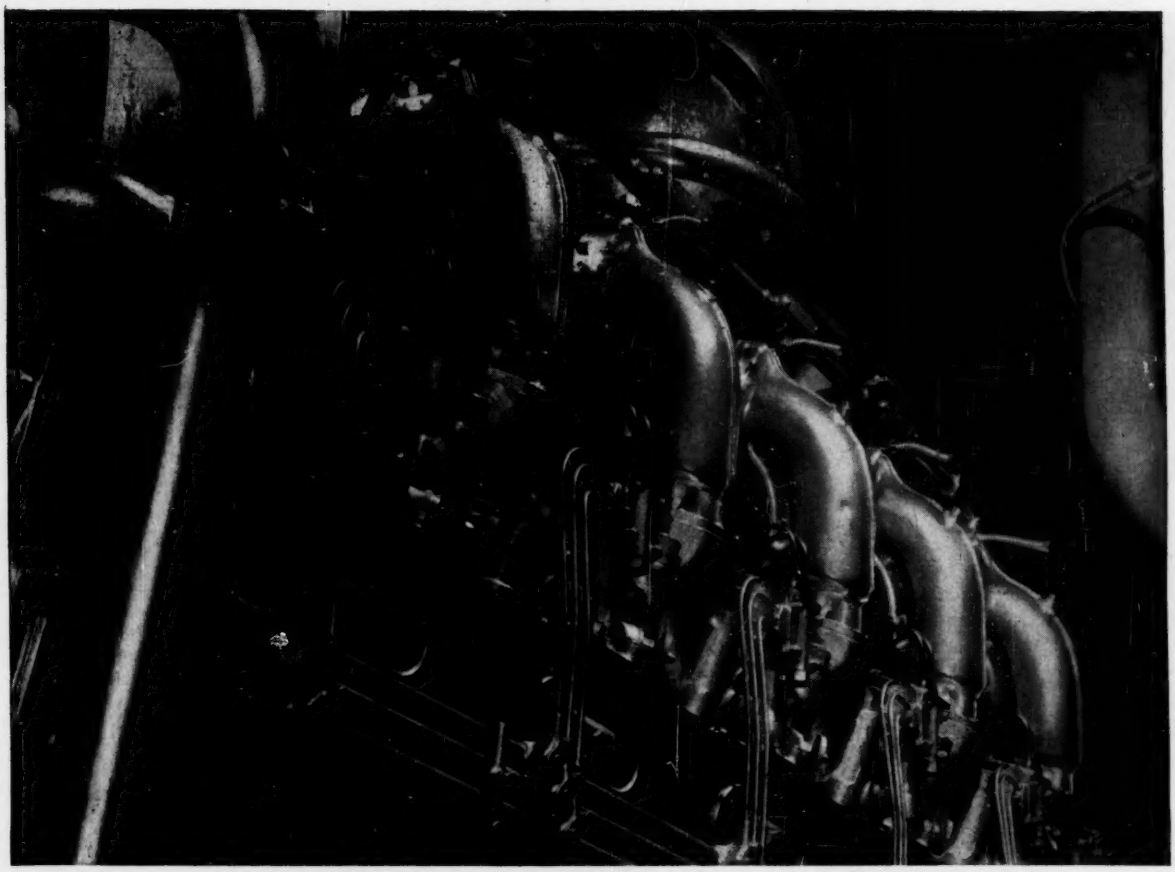
• Monsanto Chemical's Inorganic Chemicals Division has completed and put onstream the nation's first large-scale continuous-production plant for two dry-bleach chemicals, trichloroisocyanuric acid and dichloroisocyanuric acid. Having advanced from pilot-plant to commercial-scale production, Monsanto is cutting prices on both items—in truckload or carload lots—by 10¢/lb. The former price of 75¢/lb. remains in effect for less-than-carload lots.

• Another concern in an expanding mood is Shulton, Inc. (Clifton, N.J.), which has just purchased the Aer-A-Sol Division of Bridgeport Brass Co. Shulton—manufacturer of toiletries, pharmaceuticals and fine chemicals—now will broaden its operations in the consumer field with established specialty products such as insecticides and air fresheners.

• W. R. Grace & Co.—which recently reiterated that its first love is still Latin America—will be majority stockholder in a new Puerto Rican company, International Metalloids, Inc., which is building a plant 15 miles west of San Juan to produce ultrahigh-purity elemental silicon. The other parent company: Pechiney, the French chemical and metallurgical concern that some months ago entered into a silicon agreement with Grace.

•

Evidence of the sharp sales competition shaping up for '58 (p. 75) is the big shift in Union Carbide Chemical's sales setup. It's swinging over to the concept of marketing-oriented management. Generally, that means a shift of corporate thinking toward the needs of the consumer, much closer integration of other functions (traffic, packaging, production, development, etc.) with selling activities. Carbide now joins such firms as Monsanto and Koppers in using the approach. John A. Field, as vice-president—marketing, will head the new organization.



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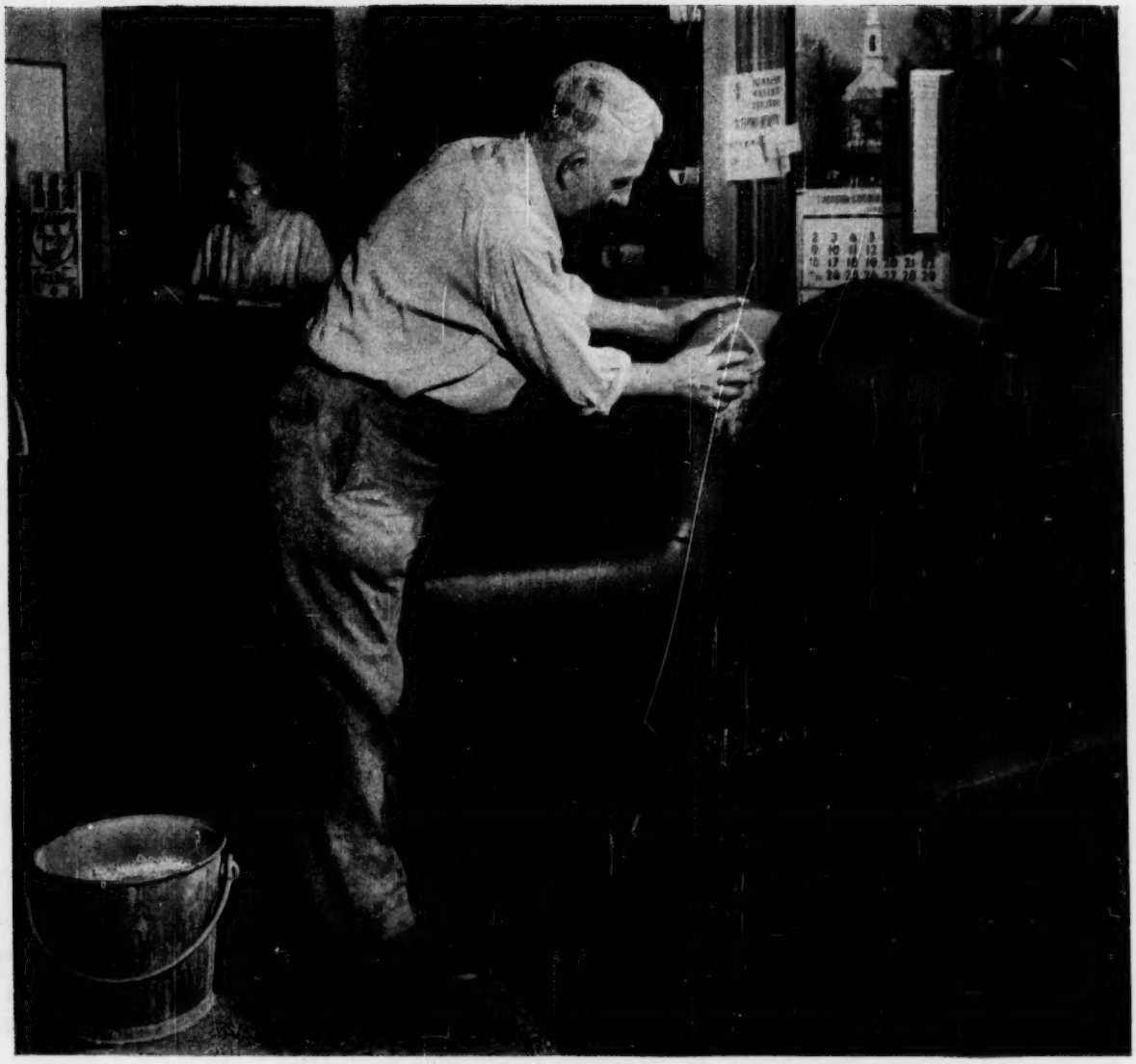

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OPINION

Presto: 14 Million

TO THE EDITOR: We read with interest your article titled "Vinyls: Kingpin Among Plastics" (*Nov. 16*).

A serious error is contained in this article insofar as it relates to the production capacity of the polymer plant of Presto Plastic Products Co., Inc. These errors are contained on page 72 . . . "And Pfaudler engineered and provided manufacturing know-how for the 7-10-million-lbs./year Presto Plastics plant in Brooklyn, N.Y.", and in your chart on page 73. We should like to inform you that the Presto Plastics polymer plant, as presently constituted, has a capacity of 14 million lbs. a year, not 7 million lbs.

Since your misstatements would definitely have an adverse effect on our trade and customer relations, we should appreciate a correction. . . .

HENRY HILSENROTH
Vice-President
Presto Plastic Products Co., Inc.
Brooklyn, N.Y.

MEETINGS

American Management Assn., special conference on how to plan products that sell, Roosevelt Hotel, New York, Jan. 13-15.

Compressed Gas Assn., 45th annual meeting, Waldorf-Astoria, New York, Jan. 20-21.

Soap Industry Convention, Waldorf-Astoria, New York, Jan. 22-24.

Plant Maintenance and Engineering Show, International Amphitheatre, Chicago, Jan. 27-30.

Society of Plastics Engineers, meeting on Progress Through Plastics Engineering, Sheraton-Cadillac Hotel, Detroit, Jan. 28-31.

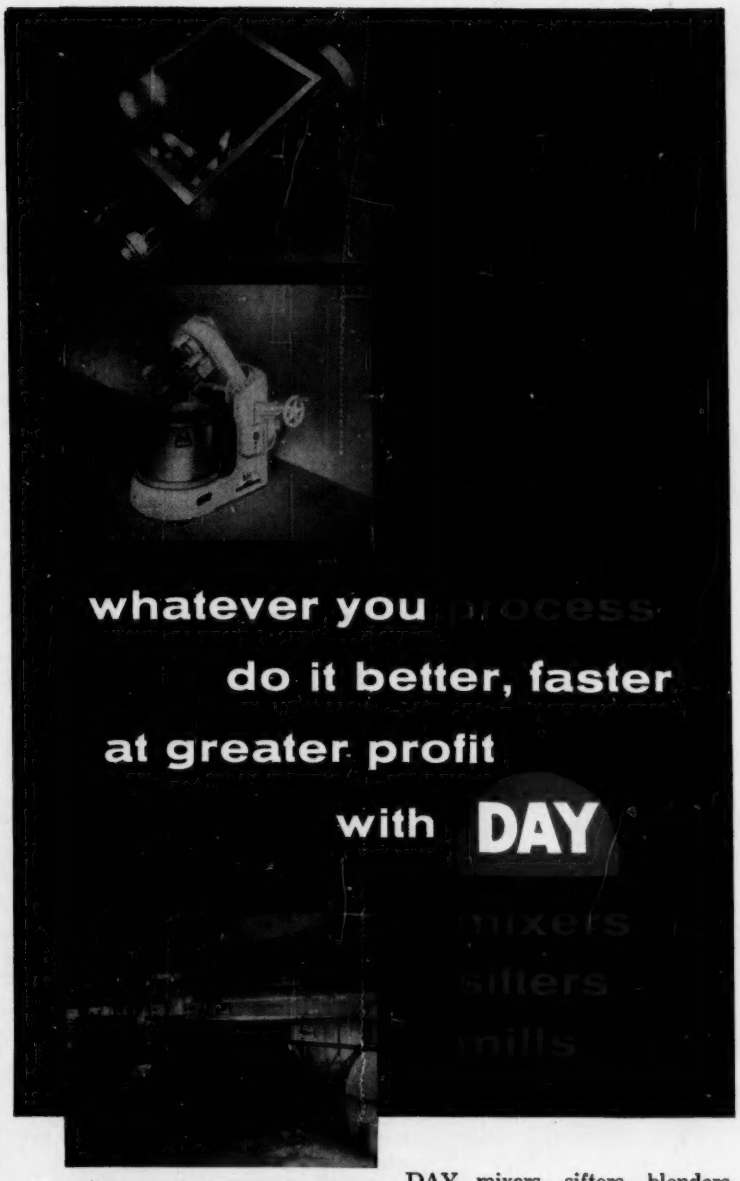
Instrument Society of America, National Chemical & Petroleum Instrumentation conference, Hotel Du Pont, Wilmington, Feb. 3-4.

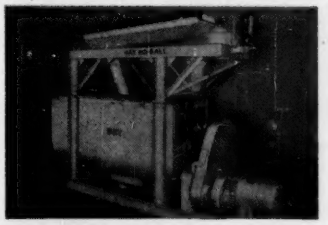
Reinforced Plastics Division of Society of Plastics Industry, 13th annual technical and management conference, Edgewater Beach Hotel, Chicago, Feb. 4-6.

American Chemical Society, Philadelphia section, second Delaware Valley regional meeting, Sheraton Hotel, Philadelphia, Feb. 5.

Chemical Market Research Assn., joint meeting with **National Assn. of Purchasing Agents;** subject: economic projections; Sheraton-Park Hotel, Washington, Feb. 6.

National Society of Professional Engineers, spring meeting, Michigan State University, East Lansing, Mich., Feb. 13-15.





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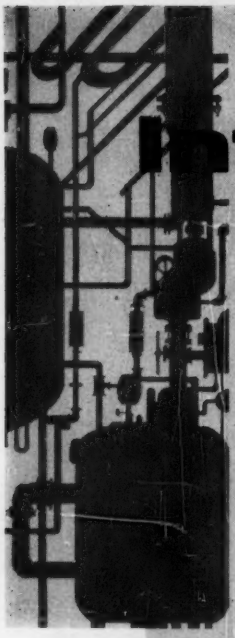

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BENZOPHENONE TECH.
BENZYL ALCOHOL TECH.
BENZYL CYANIDE
BUTYROYL CHLORIDE
n-CAPROIC ACID
CAPROYL CHLORIDE
CAPRYLOYL CHLORIDE
p-CHLORBENZHYDRYL CHLORIDE
CINNAMOYL CHLORIDE
DIBENZYL ETHER
DICYCLOHEXYL CARBINOL
DICYCLOHEXYL KETONE
p, p'-DIMETHOXYBENZOPHENONE
DIPHENYL ACETONE (unsym)
DIPHENYL METHANE
ETHYL FORMATE TECH.
ETHYL PHENYLACETATE
beta IONONE
ISOBUTYROYL CHLORIDE
ISOVALERIC ACID
LAUROYL CHLORIDE
p-METHOXY PHENYLACETIC ACID
METHYL HEPTENONE
METHYL PHENYLACETATE
MYRISTOYL CHLORIDE
PALMITOYL CHLORIDE
PHENYLACETIC ACID
PHENYLACETONE
PHENYLACETYL CHLORIDE
PHENYL PROPYL ALCOHOL
PHENYL PROPYL CHLORIDE
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Chemical Week — December 28, 1957

Polyethylene Spawns a Powder-Keg Patent

2,816,883

PRODUCT AND PROCESS OF POLYMERIZING ETHYLENE

Arthur W. Larchar, Mendenhall, Pa., and Donald C. Pease, Wilmington, Del., assignors to E. I. du Pont de Nemours & Company, Wilmington, Del., a corporation of Delaware

No Drawing. Application August 2, 1951, Serial No. 240,044

6 Claims. (Cl. 260—94.9)

This invention provides new ethylene polymers possessing a combination of properties unattained in any hitherto known ethylene polymer. These ethylene polymers melt in the range of 127° to 132° C., have a stiffness modulus of from 137,000 to 215,000 lbs./in.², a breaking strength, based on the drawn dimensions, of 40,000 to 55,000 lb./in.², an elongation at break of 1200 to 1300%, a relative viscosity of from 1.0 to 1.5, measured at 0.125% concentration in xylene at 85° C., a degree of chain branching corresponding to less than one side chain per 200 carbon atoms in the main polymer chain, and an amorphous content of not more than 10%.

—Description takes in a broad range of linear polyethylenes.

The novel ethylene polymers of this invention are made by subjecting ethylene to pressures of from about 5,000 to 20,000 atmospheres at temperatures above 45° C. but below 200° C., preferably in the presence of a material which yields reactive free radicals under the conditions of reaction.

—Polyethylenes covered in this patent are made at extremely high pressures rather than at the low pressures characteristic of other linear-polyethylene processes.

The polymers of this invention have a higher degree of linearity than any hitherto known ethylene polymers. This fundamental property is reflected in a higher melting point, higher density, greater crystallinity, and greater stiffness. These polymers are freer from chain branching and have a lower amorphous content than hitherto known ethylene polymers. These unique and distinguishing properties set these polymers aside from any hitherto known hydrocarbon polymers and are responsible for their extraordinarily high tensile strength, stiffness modulus, and elongation characteristics.

We claim:

1. Solid polyethylene, exceptionally stiff, having an amorphous content of not more than 10%, containing side chains, at a frequency of less than 1 side chain per 200 carbon atoms in the main chain as determined by infra-red absorption analysis, having a melting point above 127° C., a tensile strength, based on original dimensions, between about 2900 and about 11,800 pounds per square inch, a relative viscosity above 1.0 and up to about 1.5 measured at 0.125% concentration in xylene at 85° C., and a density (annealed) in the range of 0.95 to 0.97.

2. Solid polyethylene, exceptionally stiff, having an amorphous content of not more than 10%, containing side chains, at a frequency of less than 1 side chain per 200 carbon atoms in the main chain as determined by infra-red absorption analysis, having a melting point above 127° C., a relative viscosity between 1.127 and about 1.5 measured at 0.125% concentration in xylene at 85° C., and a density (annealed) in the range of 0.95 to 0.97.

—Du Pont contends these composition-of-matter claims are valid no matter how the products are made; others feel products are covered only if made by the process described in the patent.

—Point in question: If a polyethylene's properties differ from these claims in only one aspect, can it still be covered by the claim?

The broad-sweeping product patent (see excerpts, left) on linear or high-density polyethylene awarded last week to Du Pont could touch off the U.S. chemical industry's all-time biggest patent dispute. Claims could amount to millions of dollars worth of royalties, and important new precedents in patent law might be established. But one conclusion is reasonably sure: the powder-keg patent will not materially affect either production or pricing of polyethylene.

Du Pont contends that its new patent, U.S. 2,816,883:

- Recognizes Du Pont researchers Arthur Larcher and Donald Pease as discoverers of linear polyethylene.
- Defines this product in terms of its chemical structure and several typical physical properties.
- Gives Du Pont the right to sell licenses to domestic producers of linear polyethylene, regardless of what processes they may be using.

Phillips Dissents: But Phillips Petroleum—developer of a process for making linear polyethylene and also a major producer of the resin—takes issue with that last point. Phillips notes that the Du Pont patent has definite limitations on product claims—e.g., the one concerning specific gravity. "It is doubtful that these claims cover Phillips' polyethylene, or that they are valid and sustainable," a Phillips spokesman asserts.

Phillips, however, says its polyethylene outlook would not be too bleak, even if the Du Pont patent is found to be valid and applicable. In that case, Phillips indicates, it would apply for a license and pay royalties on its own production and on behalf of its domestic licensees: Celanese, W. R. Grace, M. W. Kellogg Division of Pullman, and Union Carbide. (Those license agreements provide that Phillips will "hold harmless" its licensees to the extent of their royalty payments to Phillips.)

Another licensor of process know-how for making linear polyethylene—Germany's Professor Karl Ziegler—also takes a critical view of the new patent. "Nobody nowadays," Ziegler

told *CW*, "will be so foolish as to use 7,000 atmospheres pressure (specified in one of the process examples listed in the Du Pont patent) in a process that works as well with one atmosphere pressure."

Questions of Coverage: All U.S. producers are scrutinizing the exact wording of the new patent to determine whether their respective products are covered. It's conceded that Du Pont's specification on side chains —"less than one side chain per 200 carbon atoms in the main chain"— would apply to the products of most principal linear-polyethylene processes used in this country. Included here are processes developed by Phillips, Standard Oil (Indiana), and Ziegler.

But several companies tell *CW* there's a chance that their linear polyethylene resins may be exempt from Du Pont licensing requirements on other grounds. For example, one concern hints that it may be able to market a linear polyethylene of 0.94 specific gravity and another prospective producer believes its resin may weigh in at 0.98. The Du Pont patent specifies a density range of 0.95-0.97.

Capacity to Double: One possible gauge of royalties at stake is Du Pont's statement that it has spent more than $6 million on linear-polyethylene research. Another is the prospect that total U.S. capacity for this material—now nearing 300 million lbs./year—will be almost 600 million lbs./year by 1960.

Major producers now are Phillips, Union Carbide, Grace, Celanese and Hercules. Koppers and Dow are building plants, and various other companies—including Spencer, Texas Eastman, and Monsanto—are in the pilot-plant stage. Du Pont is planning a plant at Laplace, La.

Farbwerke Hoechst is a large producer in West Germany. In Italy, Montecatini has produced some linear polyethylene, but now is concentrating on polypropylene. Britain's Imperial Chemical Industries is looking closely at linear polyethylene possibilities.

Twenty-year Tale: The polyethylene story goes back more than two decades, when it became known that ethylene—obtained chiefly as a petroleum refinery by-product — could be polymerized to yield oils ranging from relatively light to fairly viscous. Reaction temperatures ranged to 400 C, pressures to 200 atmospheres.

In about 1935, a trio of ICI researchers developed processes for producing commercially useful solid polyethylene. Their British patent and a corresponding U.S. patent (2,153,553) issued in 1939 covered these processes and recognized fairly broad product claims. Process temperatures ran to 100-400 C and pressures to 500-3,000 atmospheres. Phrases defining the product included: "A tough solid at normal temperatures, melting point 100-120 C, molecular weight of at least 6,000, crystalline structure."

That served as the basic polyethylene-resin patent in this country up to its expiration in April '56. Du Pont and Carbide were the first U.S. producers, under ICI license, of that low-density, forked-chain plastic. This product was a major consideration in the ICI-Du Pont antitrust case (*CW, Nov. 23, p. 23*).

Breakthrough: Robert Hershey—general manager of Du Pont's Polychemicals Dept. who was recently elevated to vice-president, director and member of the executive committee—says Du Pont has been researching ethylene plastics since the middle 1930s, "with linear polyethylene a clearly specified early objective." The work included investigation of several high- and low-pressure techniques for manufacturing linear polyethylene; other laboratories have subsequently developed other low-pressure processes.

But the new patent covers the product no matter how it is manufactured, Hershey declares. The patent, incidentally, was issued 10 years after the original application, six years after the amended application and after lengthy proceedings before Patent Office tribunals and an appeal by Du Pont to the U.S. district court at Washington, D. C.

One observer raises the question of whether this new patent—which was pending while the ICI-Du Pont case was being tried in the federal district court at New York—might be subject to the compulsory-licensing-at-reasonable-rates provisions of Judge Sylvester Ryan's decree (rendered in 1952) in that case. Du Pont, queried by *CW*, voiced the opinion that this patent would not fall under those provisions. But—under that decree—if compulsory licensing is required, then cross-licensing would also be required —i.e., each company licensed by Du Pont would have to grant licenses to Du Pont on any patents held in the same field.

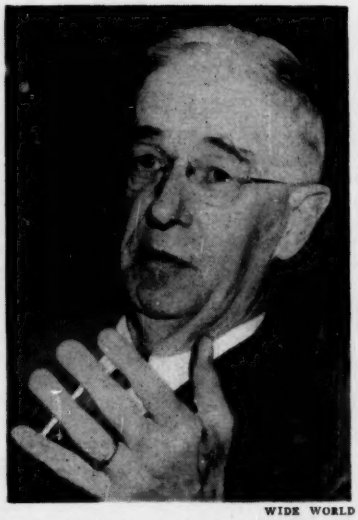
Several years ago, Du Pont was awarded linear-polyethylene patents in at least two other countries, Canada and the United Kingdom. Now that a similar patent has been issued in the U.S., Du Pont appears to have gained in linear polyethylene the same kind of primacy that it had previously attained in nylon, neoprene and polyurethane. But Phillips—which has granted linear-polyethylene process licenses to leading chemical companies in Germany, England, France, Italy, Japan and Brazil as well as in the U.S.—is contesting the claim.

Taking Over at the Top

Merck & Co. has appointed two men, prominent in national affairs, to top-executive posts. Vannevar Bush—scientist, educator and government advisor—takes over as board chairman. And George Perkins, until recently the U.S. permanent representative on the North Atlantic Treaty council, has been re-elected to the board.

Both have long-standing links with Merck. Bush, since 1949, has served on the board's executive committee and as a company director. As chairman, he succeeds the late George W. Merck, who died last month.

Perkins was executive vice-president of the company from 1927 to 1948.



WIDE WORLD

Bush: Scientist, educator, U.S. advisor, now board chairman.

In Buenos Aires, trouble may be brewing for U.S. business.

Argentine Investments Rise

Increasing numbers (table, below) of U.S. chemical and pharmaceutical firms betting on Argentina's future are this week re-examining several recent and upcoming events that may strongly affect their chances of winning profits. Argentine marketing, political and economic conditions affecting their investments rest heavily on the outcome of these events:

- Its agreement with Germany to break up the industrial and chemical combine built by former President Juan Peron with German assets.
- Its "Paris Club" pact with 11 European nations—consolidating its European debts, providing a clearing house for trade payments.
- Elections next Feb. 23, in which Maj. Gen. Pedro Eugenio Aramburu's moderate and pro-U.S. provisional government will be replaced, possibly by an ultranationalistic, anti-U.S. group.

Back in the Saddle: The breakup of the industrial combine involves the return of patents and trademarks to former owners. This may make Argentine market conditions a lot tougher for many U.S. firms. Moving onto the scene will be the German firms of Farbenfabriken Bayer, E. Merck, Schering, Beiersdorf & Co., Farbwerke Hoechst, and Badische Aniline- & Soda-Fabrik.

There will be heightened competition for the markets for some 400 chemical and pharmaceutical products —especially aspirin. Affected most will be Parke, Davis, Abbott Laboratories, Chas. Pfizer, Lederle, Warner, Du Pont, and Johnson & Johnson. Olin Mathieson will find more competition in the important fertilizer market.

They are among the U.S. chemical and pharmaceutical firms that have been leading the wary return of foreign investments to Argentina. Since Feb. '56, 18 of them either invested or made commitments totaling $18.5 million. Often they chose to pitch in with local firms. Biggest draw is the drug and cosmetics market, which last year accounted for 5% of the country's total sales volume.

Which Way Trade? The Paris Club agreement places Argentina on the solidest economic ground since the Peron debacle swamped the nation in inflation and debt. It will strengthen European confidence in Argentine ventures, loosen Argentina's sluggish foreign trade—but not in the direction of the U.S., where its trade deficit now totals $96 million.

Among Argentina's basic shortages, chemicals rank high. The country must import each year—so far, mostly from the U.S.—some 70,000 tons of soda ash, 50,000 tons of sulfur and some 45,000 tons of caustic soda. That's why Argentina is wooing foreign investors.

Crucial Elections: Part of outgoing Aramburu's course of action has been to encourage foreign investments, but his strong political opposition disagrees. Further, the Feb. 23 elections come at a time of increasing labor unrest, heightened by rising cost of living. That combination—to U.S. investors, at least—seems a bad omen.

PARENT COMPANY	PRODUCT	INVESTMENT	LOCATION
Pfizer	pharmaceuticals	$7-8 million	Buenos Aires
Monsanto	polyvinyl chloride	2.8 million	Mendoza Province
Norton	silicon carbide, aluminum chloride	2.8 million	Mendoza Province
Standard Oil (N.J.)	hydrocarbons	2.5 million	Campana
American Cyanamid	pharmaceuticals, animal feeds	2 million	Florencia Varela (Buenos Aires Province)
Koppers	polystyrene	864,000	Buenos Aires
Du Pont	cellophane*	220,000	Santos Vega
Inter-American Promotion	polystyrene sheeting	105,000	Buenos Aires

** Addition to plant.*

COMPANIES

Michigan Chemical Corp. is paying its first dividend in 22 years of operation. The board of directors has declared an annual dividend of 25¢/share plus a 4% stock dividend, both on common shares. Company President Theodore Marvin says the board's action was justified by present earnings and long-term prospects of continued expansion in pharmaceutical intermediates, bromine, magnesia and other brine chemicals, and in rare earths.

•

Offshore Sulphur Corp. (Shreveport, La.) is changing its corporate name to Oil and Production Corp.

•

Air Reduction Co.'s Ohio Chemical & Surgical Equipment Co. Division has brought onstream two plants in Cleveland to produce medical gases. Projected yearly output: 240 million gal. of nitrous oxide, 9 million gal. of cyclopropane. Investment in the facilities: more than $1 million.

•

Consolidated Cement Corp. (Chicago) has marketed a $5-million offer in 5% sinking-fund debentures to be retired at the rate of $380,000/year through 1971. Proceeds will be used to pay off outstanding notes and to increase the company's working capital.

•

Interchemical Corp. next month will consolidate its R-B-H Dispersions Division and its Textile Colors Division into a new Color and Chemical Division. Headquarters will be at Hawthorne, N.J.; general manager will be William Davies.

•

Catalysts and Chemicals, Inc., has filed a charter of incorporation in Delaware. Corporation Trust Co. (Wilmington) is serving as principal office for the new company.

EXPANSION

Agricultural Chemicals: Food Machinery and Chemical Corp.'s Niagara Chemical Division will build an agricultural-chemicals plant in Greenville, Miss., to consolidate the liquid production of its Pine Bluff, Ark., plant and dust production at its New Orleans plant. Startup date is March 15.

•

Paper and Pulp: International Paper Co. is looking over possible sites for a pulp and paper plant in Oregon, Washington or northern California. The site study will be presented to the board of directors when completed sometime after Jan. 1.

•

Cleaning Products: Wyandotte Chemicals Corp.'s J. B. Ford Division is planning to open a manufacturing plant at Toronto, Can. A 10-acre plant site has been purchased in Scarborough Township, nine miles from downtown Toronto. No date has been set for start of construction.

FOREIGN

Hydrocarbons/Scotland: Two plants—total construction cost estimated at $22.5 million—are being built by British Hydrocarbon Chemicals at Grangemouth, Scotland, for large-scale production of synthetic phenol and high-density polyethylene. Completion is scheduled for 1959. This company, jointly owned by Distillers Co. Ltd. and British Petroleum Co. Ltd., is already making benzene at Grangemouth for production of styrene monomer and detergent alkylate, and has added a second propylene cracking unit to feed its new phenol plant.

•

Nuclear Fuels/Abroad: Departing from its general policy of not financing raw-materials requirements in foreign industrial projects, the Export-Import Bank of Washington has decided to consider financing the lease or purchase of nuclear fuels in connection with atomic power loans. Edward Lynch, the bank's atomic energy advisor, says such loans also may cover U.S.-built equipment to be installed in foreign reactors.

•

Inorganics/Brazil: Production of lime has started at the $10-million, 80,000-tons/year Alcali factory in Cabo Frio, Rio de Janeiro, Brazil. Within a year the plant will begin producing five other inorganic products: caustic soda, 20,000 tons/year; potash, 72,000 tons; plaster, 22,000 tons; magnesium oxide, 8,000 tons; calcium carbonate, 27,000 tons.

•

Soap/Burma: With a 15-year guarantee against nationalization, Unilever Bros. of England has contracted to build a $14-million soap plant in Rangoon, Burma. Construction is scheduled to begin next spring, with production to start in '59.

•

Petrochemicals/Australia: Four years after it was organized, Australia's first petrochemical venture, Petroleum and Chemical Corp. (Australia) Ltd., has earned its first profit. Net for the past year was $29,000, compared with the previous year's $175,000 loss. The company is looking into two new projects: production of resins from light oils, and separation of benzene, toluene, xylenes and other aromatics.

•

Acetylene/North Ireland: Carbide Industries Ltd. is building a carbide and acetylene plant near Londonderry, Ulster, to supply acetylene for the nearby neoprene plant to be built by Du Pont Co. (United Kingdom) Ltd. Initially, the principal raw materials—limestone and coke—will be shipped from England; but eventually the plant may use native limestone.

this polyethylene coating

opens the way to lower-cost shipping

Weyerhaeuser Timber Company chose multiwall bags coated with BAKELITE Brand Polyethylene for shipping their "Silvacon" Orchid Bark. The coating preserves the unusually high moisture content of this Douglas Fir bark, used as soil for growing orchids. Polyethylene-coated bags by Bemis Bro. Bag Company.

See that protective coating of BAKELITE Brand Polyethylene! It can help you beat the profit squeeze by allowing you to change from more expensive shipping containers to lower-cost multiwall bags. With polyethylene inside, you can use a less expensive packaging material outside. Chemically inert, BAKELITE Brand Polyethylene assures maximum purity of contents. It strengthens paper fibers, guards against abrasion. It keeps moisture from getting in or out.

This new improved multiwall paper bag is but one example. BAKELITE Brand Polyethylene can also add greater efficiency and economy to film and foil containers—for powders, solids and most liquids. For the names of suppliers of polyethylene coatings, write Dept. BF-34, BAKELITE COMPANY, Division of Union Carbide Corporation, 30 East 42nd Street, New York 17, N. Y.

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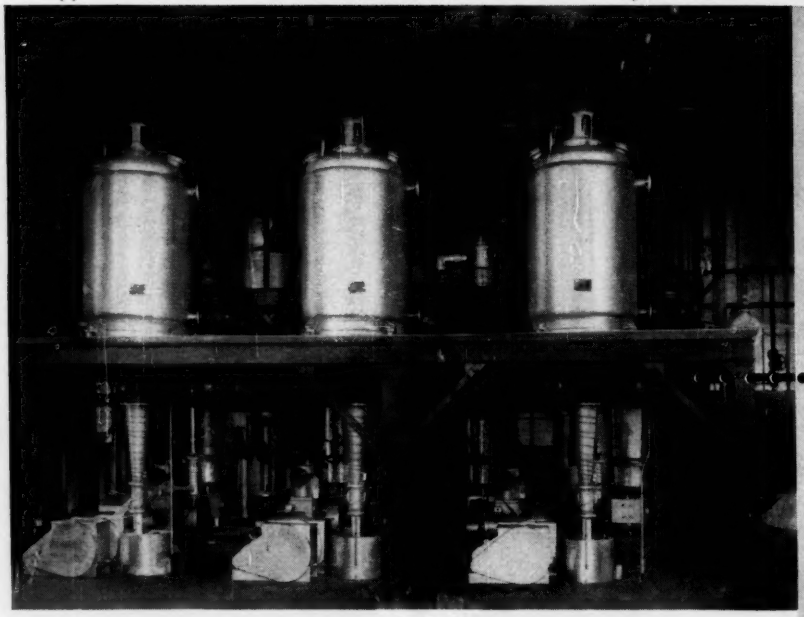

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are you the 1 in 20 who knows how*

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- Purification of Monoglycerides
- Isolation of Natural Oil Components
- Distillation, Decolorizing, Recovery
- Purification of Pharmaceuticals
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Washington
Newsletter

CHEMICAL WEEK
December 28, 1957

If you buy natural gas from a local utility, fed by an interstate pipeline company, you will be affected by a U. S. Appeals Court ruling that an interstate gas pipeline may not apply to the Federal Power Commission for a rate hike unless all its local gas-company customers agree in writing.

Pipeline companies say the decision, involving United Gas Pipe Line Co. and the Memphis, Tenn., local gas distributor, will seriously hurt interstate pipelines financially—complete customer approval for a rate boost is virtually impossible to line up. Gas supplies may be pinched as a result, unless the Supreme Court overturns the decision on an appeal filed by the FPC.

Local utilities already are citing the decision in opposing suppliers' proposed rate raises, but some are having second thoughts. One pipeline has recently notified its customers that it is halting exploration until the matter is finally decided.

The most immediate effect will be felt in and around Chicago. The decision quashes Natural Gas Pipeline Co. of America's proposed expansion by tieing up with Colorado Interstate Gas Co. and Pacific Northwest Pipe Line Corp. This added capacity was to go mostly to customers in the Chicago area.

On the other hand, customers in natural-gas producing states may get an even better break on both supplies and prices. In-state buyers are favored customers and the new decision—if it sticks—will make this even more evident.

•

There are signs that the coming Congressional trade battle will be tempered with compromise. Cases in point: the White House asked for both new tariff-cutting and tariff-raising authority; it has given Commerce Dept. a new role in advising on trade policy; and it has shown that it will grant escape-clause relief. Tariffs on clothespins and safety pins were boosted recently. Lead and zinc duties are likely to be hiked soon.

These concessions are partly aimed at forestalling emasculation of the Reciprocal Trade Agreements Act, up against its toughest opposition in years. But they also indicate White House willingness to give ground on a case-by-case basis.

An important man in all this is Rep. Wilbur Mills (D., Ark.), the new chairman of the House Ways & Means Committee, which handles all trade legislation. Mills replaces Rep. Jere Cooper (D., Tenn.), who died last week. Mills is not as "free" a trader as was Cooper, although he favors a liberal trade policy. The champion of liberal trade is Mills' colleague, Rep. Hale Boggs (D., La.), chairman of the Ways & Means Foreign Trade Policy Subcommittee. This subcommittee's report (now

Washington Newsletter

(Continued)

being written) on recently concluded trade hearings will be the bible for liberal-trade proponents.

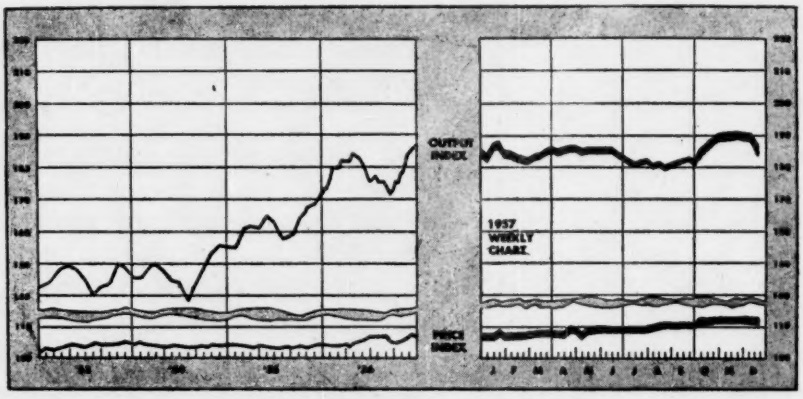
Most likely upshot of the trade debate: Congress will okay a continued program of moderately liberal trade for a shorter period of time than that requested by the President. The President will likely be given more authority, if not absolute direction, to restrict imports that are in serious competition with domestic products.

•

Incentives for scientists, already being offered in big packages by industry, will also be sweetened up by the federal government. The Civil Service Commission has okayed raises up to $1,000/year for some 45,000 scientific employees—Pentagon scientists and engineers—at a salary ceiling at or above $7,500/year. Cost: $20 million.

The government's new pay schedule applies to engineers and physical and life scientists and mathematicians and statisticians. Some other scientists—biologists at government research laboratories, for instance—have protested their exclusion.

And a new government report on employment of scientists recommends upping college-graduate starting salaries another $1,000 a year, paying moving costs, and offering new health insurance benefits similar to industry's. The report warned that unless such steps are taken in the next six months, "federal scientific programs will suffer." The Administration will ask Congress to approve the new steps this session.



Business Indicators

WEEKLY	Latest Week	Preceding Week	Year Ago
Chemical Week output index (1947-49=100)	187.0	187.5	187.1
Chemical Week wholesale price index (1947=100)	111.3	111.2	107.5
Stock price index of 11 chemical companies (Standard & Poor's Corp.)	38.92	40.05	44.14
MONTHLY **Production (Index 1947—49=100)**	**Latest Month**	**Preceding Month**	**Year Ago**
All manufacturing and mining	141	145	147
All chemical products	186	189	181
Industrial chemicals	205	208	199

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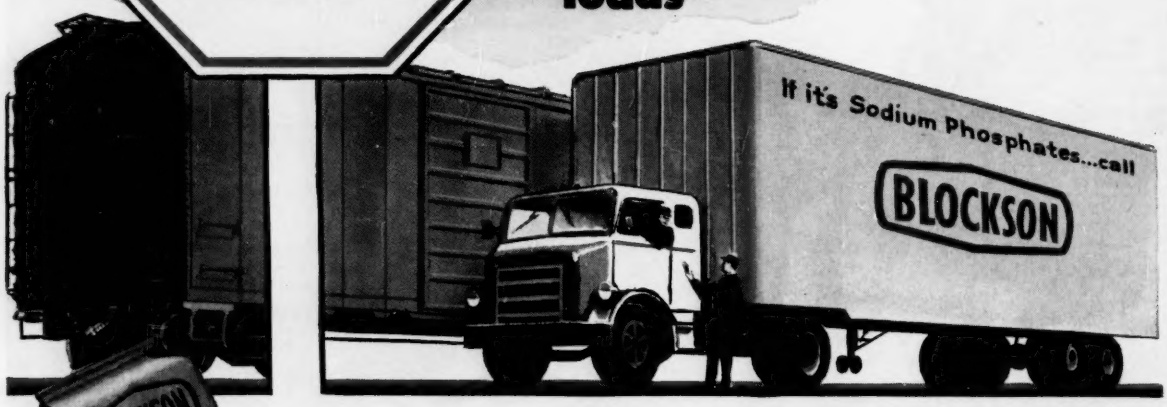

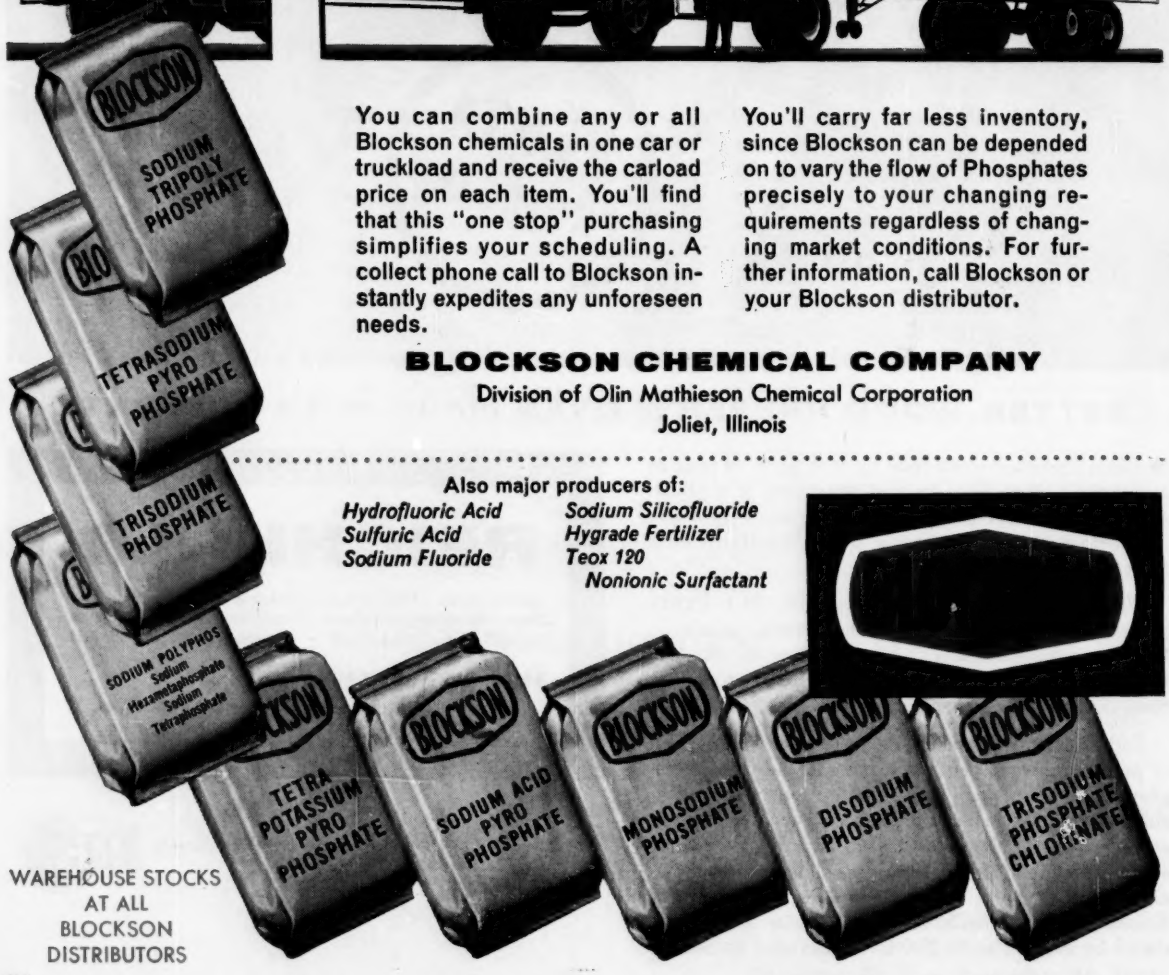

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Planning for a

Worldwide Oil-Chemical Union

Members: Chemical workers, oil workers, atomic workers

Strength: 1 million-plus membership

Nations: U. S., Holland, Colombia, Cuba, Egypt, Italy, Pakistan, Ghana, Trinidad (expected: Nigeria, Germany)

Affiliations: AFL-CIO, ILO, International Confederation of Free Trade Unions, International Federation of Industrial Organizations and General Workers' Union

IFPW's Haskins: In his view, only major obstacle to international federation is per-capita tax.

Worldwide Chemical Union Gets Assist

Efforts to create a worldwide federation of national unions representing oil, chemical and atomic workers got an assist at the just-completed AFL-CIO convention in Atlantic City. The master union voted to raise $1 million in the next three years for foreign projects.

The fund will go to the International Confederation of Free Trade Unions (ICFTU), an association of labor federations. In turn, ICFTU will provide international organizing help, which may be used by the International Federation of Petroleum Workers. IFPW is in the strongest position to build a worldwide oil, chemical and atomic union.

World Aim: IFPW is headed by ubiquitous O. A. "Jack" Knight, also president of Oil, Chemical & Atomic Workers Union; general secretary is Loyd Haskins, Knight's assistant in OCAW. Haskins has been a strong worker in the creation of the international organ. It was he who last summer announced that IFPW would expand its worldwide jurisdiction to include chemical workers.

IFPW's first step in this direction is negotiation with ICFTU to arrange IFPW's merger with the chemical unions represented in International Federation of Industrial Organizations and General Workers' Union (IFIOGWU). The latter group represents more than 1 million chemical workers in Europe, including 485,000 German workers. ICFTU has given the green light for such a merger.

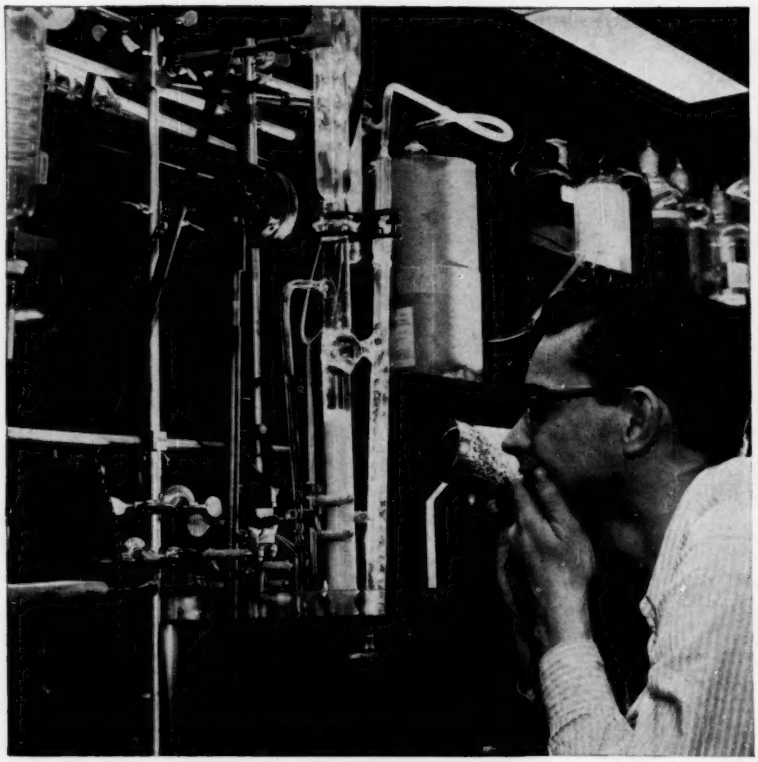
According to Haskins, the only major obstacle is IFPW's dues of 2¢ per member per month. Haskins' main problem would be to work out some compromise or exchange of funds on the per-capita issue.

European Reluctance: This view doesn't seem to be strongly shared by the Europeans. At the International Confederation offices in Brussels, a spokesman terms the discussions of merger as "vague talk." And in Holland, a Dutch labor leader and member of the board of IFPW carefully points out that no merger has been formally proposed.

OCAW Alone: So far, there hasn't been any indication that other unions of the process industries—United Rubber Workers and International Chemical Workers Union (AFL-CIO)—would join Knight's international group. ICWU says that no invitation to join has been extended to it.

If one were, there's no indication ICWU would take it up. (ICWU is affiliated indirectly with ICFTU through its membership in AFL-CIO, while the rubber union is a direct member of that international arm.)

IFPW already represents some 500,000 chemical workers internationally, but if present plans go through (*see box above*), it would represent well over a million.



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These and other characteristics make Durez phenolic resins useful as impregnants, bonds, coatings, and laminating agents. Their applications range from shell molds for metal castings to dense, strong board manufactured out of wood particles.

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ADMINISTRATION

Guidance on Giving

Process companies, pressed harder each year by demands for charitable and philanthropic contributions, are actively seeking ways of measuring the effectiveness of their programs for giving. This week, they have a set of data they can use for comparison and guidance.

It comes from Smith, Kline & French Laboratories, which has just published a thorough and complete list of its corporate grants and contributions in what it believes is the first study of this kind. There are, of course, some limitations in the comparisons that can be made, since SKF set up a special philanthropic arm, Smith, Kline & French Foundation, through which to make its grants,* and there are a broad range of other intangibles. Here's the way SKF handles its gifts:

Breakdown: SKF divides its funds into three groups: special, a fund through which the firm matches dollar gifts of employees to colleges of their choice; national, under which gifts go to organizations operating on a national scale; regional, whereby funds are distributed to groups operating in specific geographic areas of the U.S. No funds are distributed outside the U.S.

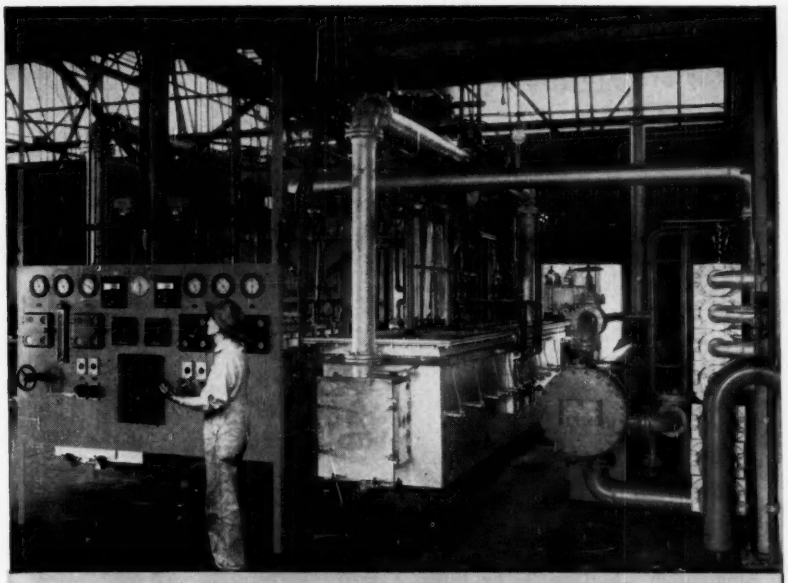
In the four years analyzed, the firm contributed $8,761 to match employees' gifts to colleges, $295,250 in gifts and grants to 44 national organizations, $1,153,865 on a regional basis. Seventy-one different groups (counting employees' college gifts as one group) received 379 separate donations.

Largest amount, totaling $673,910, went to basic research in medicine and related sciences; next in order: educational grants, $320,711, public charities, $178,650, mental health, $157,500.

SKF has made the analysis, which details every gift by dollar amount, purpose, and organization or individual to whom it went, hoping that it "may contribute to a more general understanding of the rapidly growing interest of corporations in philanthropy."

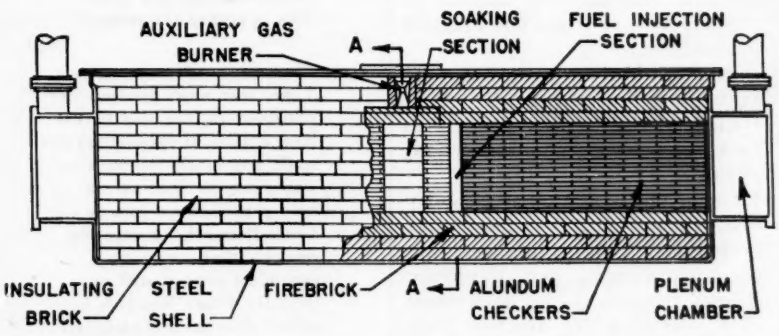
*The foundation is a legal entity separate from the labs, although its trustees are actively employed by the parent firm. Funds for the grants and contributions are annually taken directly from SKF's profits, although a small endowment is being built up in an effort to sustain the foundation during periods of fluctuating profits. Its only expense: renting safe deposit facilities.

ALUNDUM* checkers give 4 years continuous service



In this double regenerative furnace the Wulff Process Company of Huntington Park, Calif., produces acetylene starting with propane or other petroleum gas as the raw material. The Wulff Company reports that ALUNDUM checkers in this equipment are still going strong after continuous service, five days a week for more than four years.

Wulff Process Company says no replacement required in acetylene producing furnaces



Cross sectional diagram shows, in yellow, the location of Norton ALUNDUM checkers in the Wulff furnace. Air, preheated in the first ALUNDUM regenerator to 1800° F., is mixed with gas in the fuel injection section producing high temperatures and transferring this heat to the second regenerator. A propane-steam mixture is then passed in the opposite direction through the regenerators, heating and cracking in the second and cooling in the first. The heating and cracking cycles are both of one minute duration. ALUNDUM checkers take this extreme cyclic thermal stress and provide efficient, low cost operation.

Tubular passages for preheated flow are formed by ALUNDUM checkers. Their resistance to the erosion of hot gases is extremely important in many installations. Also, their purity is essential. Iron or other impurities could result in harmful side reactions in such gas cracking operations.

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ADMINISTRATION

WIDE WORLD

Judge Harris: He'll talk with lawyers on upcoming vanadium trial.

LEGAL

Vanadium Conference Set: Jan. 10 has been set as pretrial conference date for the civil suit in which Continental Ore Co. (New York) charges Union Carbide Corp. and Vanadium Corp. of America with violation of antitrust laws in production and sale of vanadium.

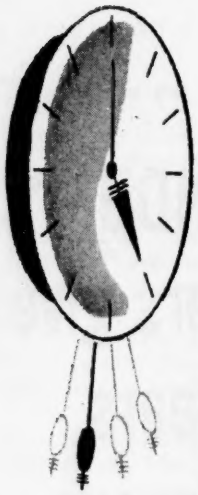
Attorneys for the three firms will meet before Federal Judge George B. Harris in U.S. district court (San Francisco). Defense attorneys are expected to seek an early trial.

Earlier this year, after an eight-day trial, Carbide and Vanadium were cleared by a U.S. district court jury of the price-fixing and conspiracy charges brought by the government (*CW, June 15, p. 37*). The New York companies had been accused of conspiring between 1933 and '46 to monopolize vanadium markets.

Continental is seeking $1.5 million in treble damages, charging that it was restrained by Union Carbide and Vanadium from entering the vanadium business in the '30s.

•

Additives Makers Charged: Three Southwestern concerns have been charged by the Federal Trade Commission with misrepresenting that gasoline and oil additives they make and sell are approved or recommended by the U.S. government. Named in the complaint are Champion Products (Stephenville, Tex.), Champion Oil Co.



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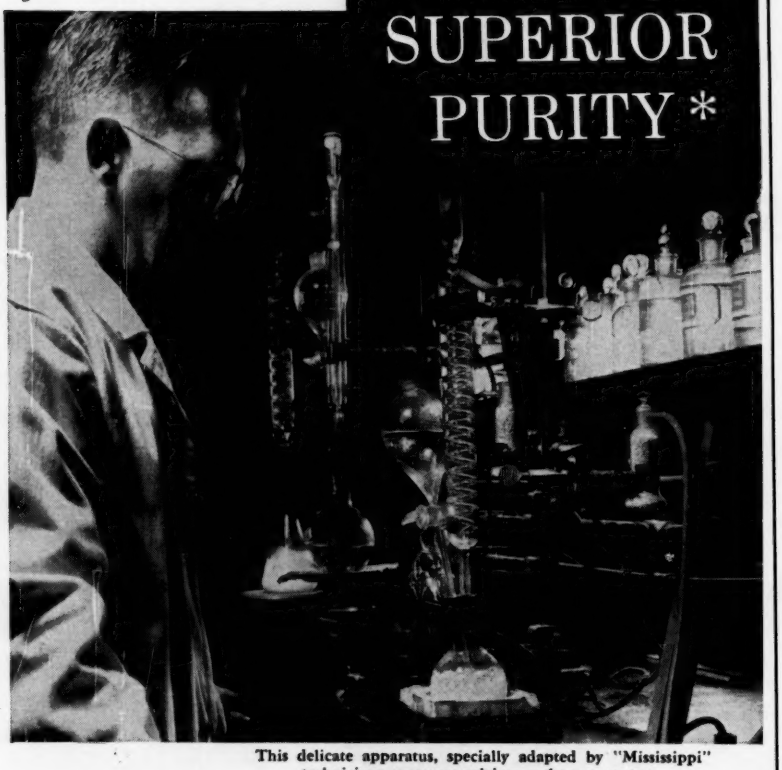

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(Ft. Worth) and Goodenow Co. (Oklahoma City, Okla.).

The complaint also charges that the companies' advertised guarantee is deceptive, because it doesn't say that before refunds are considered dissatisfied purchasers must submit performance data on the vehicles in which the products are used.

KEY CHANGES

W. L. Stewart, Jr., to board chairman; **Robert T. Collier,** to president; **Homer Reed, William C. Kaesche** and **Robert S. Ray,** to vice-presidents; **Howard W. Wright,** to secretary; **Frank H. Dlouhy,** to treasurer; and **R. G. Greip,** to controller; Collier Carbon and Chemical Corp. (Los Angeles).

Harold H. Helm and **Malcolm P. Ferguson,** to directors, United States Rubber Co.

Eric N. Blackstead, to vice-presi- and general manager of the chemicals group, Sun Chemical Corp. (Long Island City, N.Y.).

O. B. Hager, to vice-president, Alco Oil and Chemical Corp. (Philadelphia).

Robert D. Goodall and **H. B. DeVinny,** to vice-presidents, Davison Chemical Co. (Baltimore, Md.).

Harold J. Rose, to vice-president and consultant; **J. R. Garvey,** to director of research; and **John W. Igoe,** to director of administration; Bituminous Coal Research, Inc. (Pittsburgh).

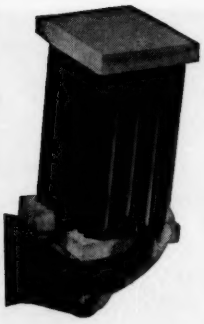
SOCIETIES

James H. Baker, director, Gar-Baker Laboratories, to president; and **Savery F. Coneybear,** director of research, Colgate-Palmolive Co., to president elect; Society of Cosmetic Chemists.

George E. Holbrook, general manager, Elastomer Chemical Dept., Du Pont, to president, American Institute of Chemical Engineers.

KUDOS

To **John H. Draize,** chief of the skin toxicity branch, Division of Pharmacology, U.S. Food & Drug Administration, the 1957 Medal Award of the Society of Cosmetic Chemists.



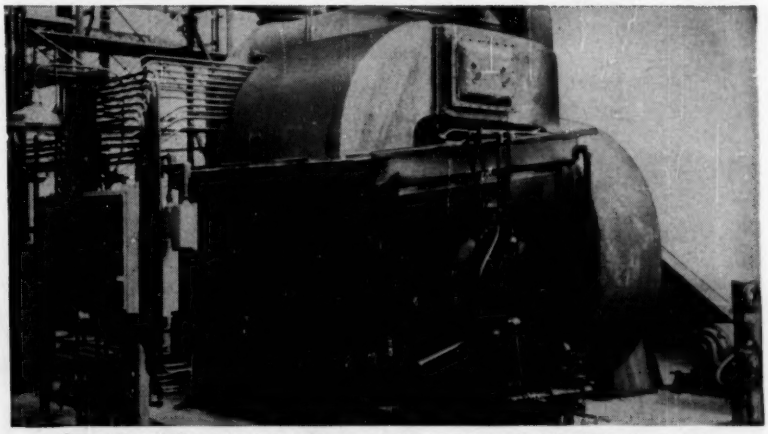
An important message to the man who thinks his air pollution problem is too difficult—or too expensive—to correct

Too often an air pollution problem exists today for one reason only: The company concerned does not yet know there is now at hand an efficient, effective method of correcting it—often at an actual saving through waste heat recovery.

The method is catalytic oxidation, and the firm that makes this development possible is Oxy-Catalyst, Inc.

Catalytic oxidation works by "burning" harmful and irritating combustible contaminants in an exhaust stream at temperatures far below their normal ignition points. It provides close to 100% cleanup of foul-smelling fumes and odors. It reduces fire hazards and maintenance problems by eliminating troublesome condensates in oven and furnace exhausts.

Thus Oxy-Catalyst installations can not only control air pollution. They can also be used to release the latent heat energy in waste and process gases. And they can sometimes do both at once.



Oxycat installation on Standard Oil Company of California's phthalic anhydride unit at Richmond, Calif.

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The key to successful catalytic oxidation is, of course, the catalyst itself. Features which make the Oxycat unique are:

- *The combination of platinum and alumina, chosen from hundreds of elements and compounds as the most active and long lasting catalytic agent*
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- *The patented method of applying the catalyst to the carrier*
- *The patented mechanical design of the Oxycat itself*

The result of this combination of features is a catalytic unit with exceptionally long life at high efficiency. Oxycats are strongly resistant to thermal shock—to contaminating agents and clogging. There's no problem of frequent cleaning or reprocessing. Oxy-Catalyst installations are still functioning at high initial efficiency after over 20,000 hours without maintenance or servicing.

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Oxy-Catalyst installations are now working effectively in a wide range of industries—oxidizing combustibles from such processes as asphalt oxidation; phthalic anhydride, polyethylene and ethylene oxide manufacturing; catalytic cracking; and many others.

Oxy-Catalyst installations are carefully engineered to your individual requirements, and our engineers, working with yours, can install Oxycats effectively in any existing plant. So, if air pollution is a problem in your operation—if irritating fumes and odors are costing you neighborhood good will—you should know that Oxy-Catalyst offers a practical, realistic answer to your problem.

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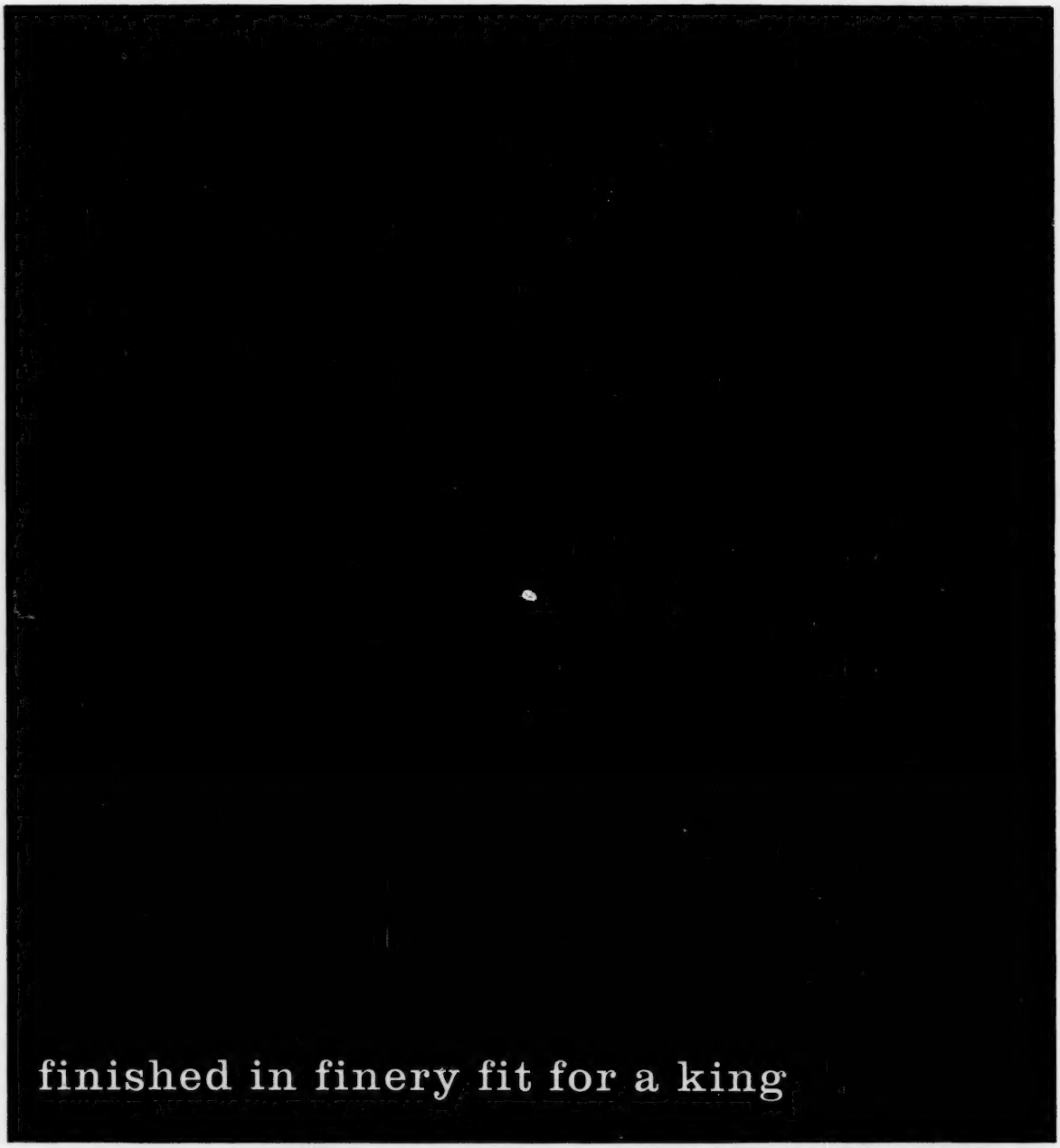

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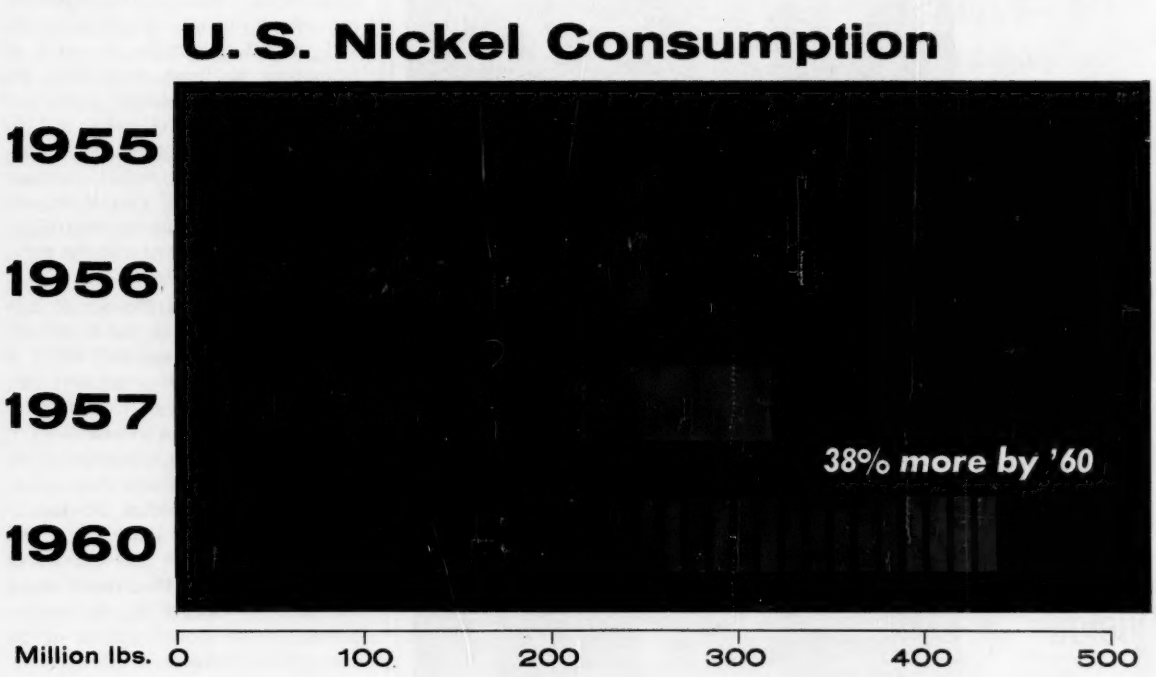


Nickel: Plenty Now, Too Much Tomorrow?

Just three months ago, the Office of Defense Mobilization announced it would divert to private industry, some 135 million lbs.* of nickel that was heading for stockpiling during '58. Purpose: to ease the current nickel shortage. But that was three days before Oct. 6, when Sputnik I made headlines. Question now: Will the nation's stepped-up missiles program force ODM to rescind its order diverting government nickel to private consumers?

Answering this question, ODM spokesmen last week told *CW*, "no action to rescind the nickel diversion program is being contemplated." It also implied that the agency has not had reason to change its previously stated opinion that it "can see no immediate change in military requirements" of nickel.

The statement also seems to answer other pertinent questions being asked about the '58 nickel supply and demand situation. One such question: Will ODM now have to reconsider the industry-jarring Senate subcommittee report, issued last spring, which charged that nickel that should have gone into the nation's defense stockpile had been diverted elsewhere? The subcommittee—headed by Sen. Lyndon B. Johnson (D., Tex.)—noted that nickel needed for jet aircraft, guided missiles and atomic defense programs were insufficient. There were also charges of "black" and "gray" markets, and of hoarding and overbuying of nickel by users who had defense priority ratings.

The subcommittee criticism centered on alleged underestimates, by ODM and other federal agencies, of nickel needs of defense and civilian users. ODM, the subcommittee suggested in its report, should review the possible need for comprehensive quantitative controls of nickel supplies.

Many industry spokesmen, more so than ODM, vociferously denied the existence of a "critical" nickel shortage, downgraded the importance attached to so-called nickel "black markets." The subcommittee findings were passed off by the critics as old, currently invalid 1956 statistics.

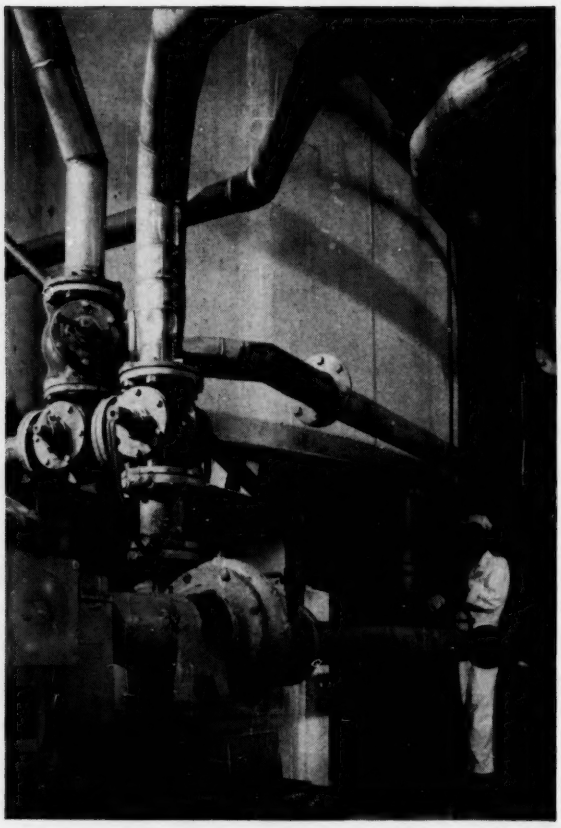
Reassurances: Months later ODM gave tacit support to the industry view by releasing, in one full swoop, all '58 stockpile-destined nickel. And the agency's spokesmen now aver that nickel supplies in the U.S. are now in "plentiful supply" and that "no real shortage exists."

But, as some observers point out, this seems at variance with the agency's stated reason for releasing the metal from the government stockpile, i.e., "to ease the current shortage of nickel." It's also at variance with estimates of some market analysts who do not anticipate a reasonably balanced supply/demand situation for nickel before '60.

Definition: Crux of the disagreement lies, perhaps, in definition of "current demand." There's apparently enough nickel around now to satisfy those vital needs that consume the bulk of current output—hence, in one sense, there's no shortage. But if demand is meant to include the potential needs of those who could use nickel, but won't because they fear interruption of supplies, then current supplies can be considered short.

Defense Priority: Defense needs, says ODM, will create no problem in any case. Nickel for these uses is

*1958 would be the second straight year ODM has diverted all stockpile nickel to private industry. About 117 million lbs. was diverted in '57.



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BETTER THINGS FOR BETTER LIVING...*THROUGH CHEMISTRY*

"taken off the top of the nation's available supply," and only then is the remainder channeled into the commercial market. Although this may be heartening to those responsible for national security, it doesn't follow that all nondefense nickel users will be content with this reassurance (unless, of course, the Senate subcommittee's allegation of overbuying was in fact correct, and unless most nickel users are better stocked with the metal than they care to admit).

Did ODM follow the Senate subcommittee's suggestion and review the possible need for controls? ODM is noncommittal on this point, says only that the U.S. Dept. of Commerce is believed to have looked into it.

On the other hand, supporting its current stand, ODM says its own observations reveal nickel demand is running "irregularly lower," and that requirements for the first quarter of '58 have declined. Predictions about the probable nickel supply/demand balance in the second quarter of '58 aren't forthcoming from the agency.

Record Stocks on Hand: Recent comments by nickel producers tend to support ODM's view that there's at least enough nickel around to meet vital needs. For example, J. Roy Gordon, executive vice-president of International Nickel Co. of Canada, and Lars R. Larson, vice-president of that firm's U.S. subsidiary, jointly stated recently that "inventories of unmelted nickel in the hands of the nickel-consuming industry at the end of September ('57) were the highest in the history of the nickel business."

"There will be more nickel available in the U.S. in '58 than there has been this year," they add, and emphasize that "the real challenge will face the nickel industry in '61, when 650-675 million lbs. will be available."

Paradoxically, this warning (aimed at Inco's sales organization) and simultaneous assurance of plentiful supplies (aimed at potential customers) in one sense indicates a current shortage of the metal. It's implied in the Gordon-Larson statement that "all this should give greater confidence to customers who wish to restore their old uses of nickel and to those who wish to include nickel in their long-range plans."

Dry-gulched by insufficient capacity, nickel producers in recent years watched their consumers turn to ma-

terials in more reliable supply. Now the possible threat of a flash flood of nickel prompts producers to soften the impact by cajoling consumers back to the customer lists.

The possible overabundance is still several years off, may never come if producers' promotional plans pay off. Not all current efforts, however, have been successful. Earlier this year, for example, Inco scouted for a way to make more sales to the U.S. government, found the road blocked. General Services Administration turned thumbs down on the firm's proposal that the U.S. agree to buy a part of its expanded output for stockpiling (*CW Market Newsletter, July 20*).

Production Push: Forthcoming big capacity boosts, coupled with uncertainty about markets, provides reason enough for nickel producers to pick '61 as the year of "real challenge."

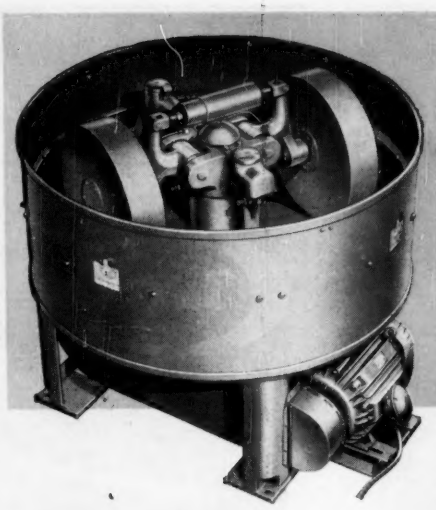
International Nickel, for example, plans to add 100 million lbs./year to its current 290-million-lbs./year capacity by '61.

And the U.S.-based firms, too, will be producing considerably more nickel before '60. Cuban Nickel Co., a subsidiary of Freeport Sulphur, is scheduled to have in operation by mid-'59 both a concentrating plant in Cuba and a large refinery at Braithwaite, La. Capacity: 50 million lbs. a year of nickel (and 4.4 million lbs. a year of cobalt).

It is this 150 million lbs./year capacity that has nickel producers worried, and pushing for new outlets: nickel-molybdenum alloys for high-temperature applications (e.g., atomic energy equipment); alloys for turbine blades; the much-talked-about auto-turbine engine; nickel-steel tubing for oil wells; stainless steels for aircraft and missile skins; electrical applications.

In some market areas—constructional alloy steels in particular—the nickel industry suffered permanent losses. During the nickel famine, many nickel alloy fabricators were forced to switch to substitute materials.

There are plainly a host of potential applications to absorb the forthcoming big boost of nickel output. But to transform potential into reality, nickel producers must turn the natural inertia of shortage-wary prospects into confidence that there's nickel aplenty.



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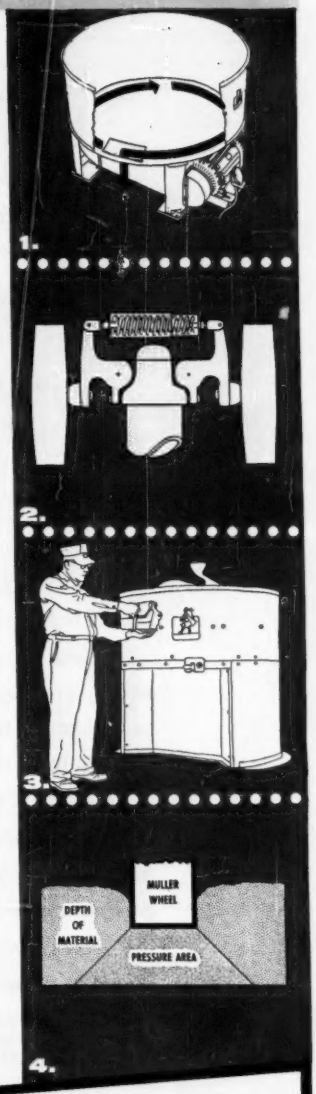

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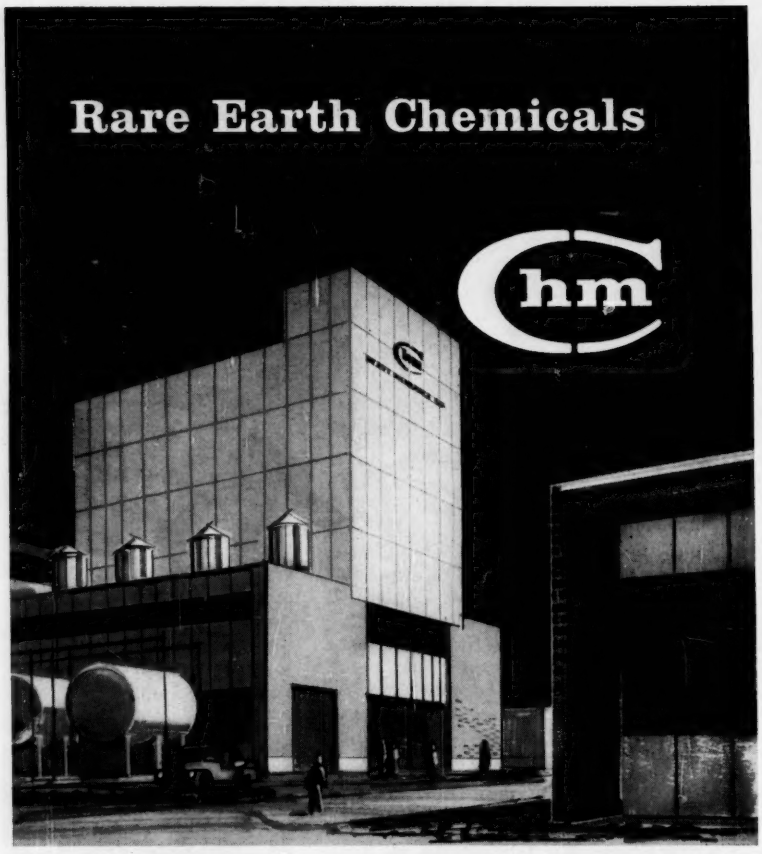

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Brazilian Binge

With New Year's Eve revelry around the corner, U.S. merrymakers are again warned that alcohol and gasoline do not mix. In striking contrast, the Brazilian government firmly insists that alcohol and gasoline do mix, in fact must be mixed.

The result is that Brazil's autos, trucks and buses consume more alcohol than do the nation's tipplers. Reason: in order to support the country's mammoth sugar industry, a pre-World War II special act of the Brazilian congress called for mixture of "excess" alcohol into gasoline for vehicles.

Hence the nation's filling stations have been dumping about 200 million liters/year of alcohol into gasoline. (This compares with 160 million liters/year consumed by sugar cane liquor imbibers.) Actual alcohol-gasoline ratios vary. In Sao Paulo regular gasoline contains from 15-20% pure sugar cane alcohol; in Rio it's about 20%, in other areas the average is a high 35%.

Careening to a Crisis? So far the plan has been working well, but there may be trouble ahead. Oil industry sources warn that next year the alcohol situation could get out of hand because the biggest sugar crop in Brazil's history—43 million bags compared with 37.5 million in '57—is in the offing.

For Brazil's oil industry the prospect is especially gloomy and hard to combat because nearly 10 million Brazilians—one-sixth of the country's total population—either work in or are otherwise supported by the government subsidized sugar industry. Furthermore, it's hard to find convincing reasons to knock the performance of the alcohol-gasoline mixtures. Mixtures containing up to 10% alcohol reportedly improve antiknock performance, boost octane ratings. In some areas "adjusted" trucks and cars are successfully powered by pure alcohol.

One harassed government spokesman describes it all as "a very complicated system," while Brazil's gasoline marketers fret about the seemingly endless encroachment of alcohol into gasoline's domain. Station mechanics are calm, mostly wonder just how much Brazilian firewater cars can take before they develop cirrhosis of the cylinder.

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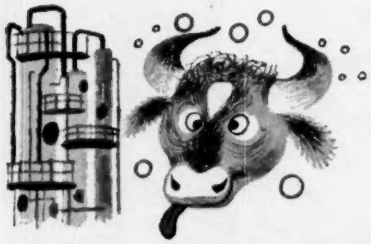
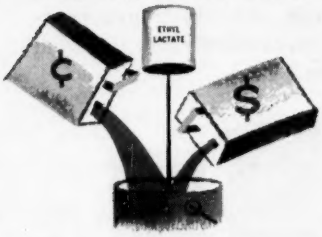


Ethyl lactate is *not* the product of alcoholic cows! In fact, our AERO Ethyl Lactate has nothing to do with any bovine product. It is completely *synthetic*—thereby making possible a purity and quality consistency that impresses the most critical buyer.

Most important to chemists, though, are the unusual solvent properties resulting from its dual role as an alcohol and an ester.

"Coupling" Cuts Costs



The use of weak diluents in lacquers is limited, of course, by their compatibility with true solvents and lacquer resins. A higher ratio of low-cost diluents can be used when ethyl lactate is present as a "coupler," due to its mutual solubility with solvent, diluent and vehicle. This is a "money-in-the-bank" saving on each drum of lacquer you make... as well as a broadening of the formulation possibilities toward modifying the application of final-coat properties.

The Unwanted Blush

The "real cool" surface produced by fast evaporating lacquer solvents often causes atmospheric condensation. Coating chemists who are painfully familiar with the resulting surface-marring "blush" will be glad to know that ethyl lactate has relatively low volatility and 5 to 10% will significantly reduce the over-all evaporation rate. More important, the slow-evaporating ethyl lactate is compatible with water, eliminating or greatly reducing the "blushing" effect if condensation does occur.

Adhesives and Dipped Rubber

Cellulose derivatives such as cellulose nitrate, cellulose acetate, cellulose butyrate and ethyl cellulose are soluble in AERO Ethyl Lactate. Nitrocellulose adhesives, for example, can be made with ethyl lactate whenever a controlled drying rate is required. In certain dipped-rubber operations, ethyl lactate gives more even mold wetting, thereby producing an even, level rubber film.

We Have It

AERO Ethyl Lactate is available in 55-gallon drums and 5-gallon cans ... (and we're the *only* manufacturer of synthetic ethyl lactate). Our AERO Ethyl Lactate is clear and almost water-white. Odor is mild and characteristic. Flash point is 145° F.

Though we've covered only surface coating and adhesive applications here, we are not at all averse to selling our AERO Ethyl Lactate for *any* purpose served by its unusual solvent properties.

Samples and technical information will be sent on request. We like to get inquiries... and for busy chemists, the coupon to the right will bring a rapid response. Tear it out now.

American Cyanamid Company
Manufacturers Chemicals Department
30 Rockefeller Plaza, New York 20, N.Y.

Gentlemen:
Please send me

☐ Bulletin on AERO Ethyl Lactate
☐ Sample of AERO Ethyl Lactate

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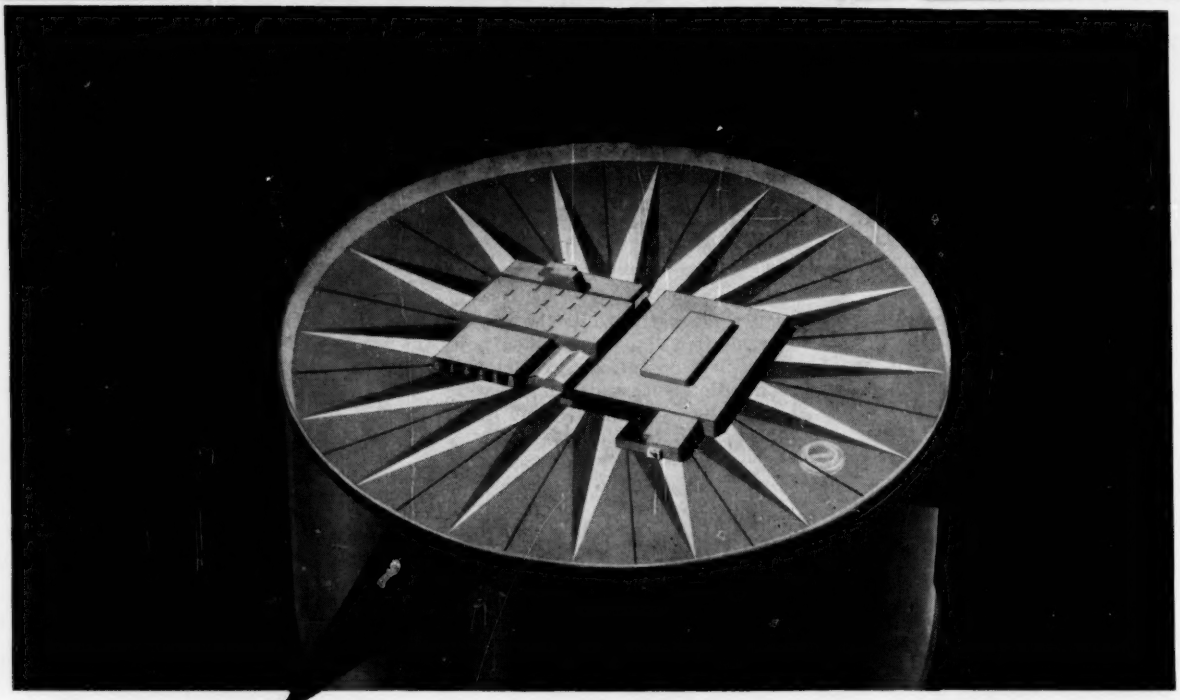
Company_____
Address_____
City_____ Zone_____ State_____

In Canada: North American Cyanamid Limited, Toronto and Montreal



In the South, move your chemicals in safe Southern States steel drums

Southern States steel containers, manufactured in the heart of the South's steel district in Birmingham, are offered with all types of linings for chemical products. Diamond Black Leaf Company uses Southern States drums to carry a variety of emulsifiable insecticides. The Quaker Oats Company ships furfuryl alcohol in their containers. West Disinfecting Company uses these drums to ship a wide variety of industrial plant compounds and other chemical products.

Prominent companies in the process industries have proved the quality of these metal containers through storage and shipping. Special liners have been used to meet the requirements of many companies in keeping their products away from the interior metal. Many companies are using drums decorated by Southern States, with identifications silkscreened or stenciled to specifications.

When you are ready to move food, chemical or petroleum products in the South, call us. Many forward-looking firms are relying on Southern States service for prompt, accurate drum deliveries. If you would like more details now, we shall be glad to supply them.

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SIRCO

FORMERLY SOUTHERN STATES IRON ROOFING CO.

SOUTHERN STATES CONTAINERS

Now pulpers have a choice of wood digestion processes

Batch process has these advantages:

- it simplifies adjustment of cooking conditions, which vary with the species and grade of wood used.
- it uses multiple digestion units that can be shut down one at a time for repair.
- it is familiar to pulpers whose existing batch equipment is too valuable to scrap.

Kamyr continuous process has these:

- it adapts to automatic control by a single operator, reduces operating cost of pulp mill.
- it minimizes maintenance requirements by eliminating conditions that promote corrosion.
- it gives higher yields of more uniform pulp; is cheaper to install than batch plant of the same size.

Continuous Cooking Catches On

Though the pulp and paper industry has long been one of the staunchest proponents of batch processing, pulpers aren't wasting any time about getting in on the advantages afforded by a Scandinavian continuous-digestion process (*CW Technology Newsletter, Dec. 14*). Developed by Kamyr* (Karlstad, Sweden), the process has already won production berths in several foreign plants, one Canadian and three U.S. mills. And a fourth U.S. installation is scheduled to start up early in '58.

Largest American installation, to date, is a two-digester system built by Kamyr, Inc.,* for Northwestern Pulp & Power Ltd.'s new plant at Hinton, Alta., Can. In operation since early summer, the unit has attained pulp production in excess of rated capacity (nominal capacity of each digester is 250 tons/day) for short periods. Kamyr agrees that rating is "quite conservative," says there are indications that NPP's digesters can be operated at 300-350 tons/day.

A. H. Lundberg sold a 150-tons/day Kamyr digester as an addition to Weyerhaeuser Timber Co.'s existing batch plant at Longview, Wash. Here, in direct competition with the conventional batch method, the continuous process is making good its claim of labor savings, requires only one operator, whereas five men are needed to run the 600-tons/day batch plant.

Other U.S. plants by Kamyr, Inc., include a 175-tons/day addition to International Paper Co.'s batch plant at Camden, Ark., a 300-tons/day digester in a new Gulf States Paper Co. plant in Demopolis, Ala. Kamyr's fourth U.S. job: a new 200-tons/day plant for Eastern Corp. at Lincoln, Me. Due onstream in '58, Eastern's plant will be the first to pulp hardwood by the continuous method.

Bypassing Batch Problems: Key to the efficiency of Kamyr's continuous digestion technique lies in its equipment, specially engineered to provide optimum reaction conditions. Minor mechanical problems have been overcome, reports Kamyr, and the system has been used successfully for both neutral sulfite pulping (in Sweden) and sulfate pulping. So far, it hasn't been used for sulfite pulping because the vapor pressure of SO_2 makes it difficult to introduce chips into the digester without loss of chemicals.

In the Kamyr process, wood chips are first moved by screw conveyor through a low-pressure, horizontal steam vessel. This operation drives off air and turpentine, eliminates the need for vapor space at the top of the continuous digester. Low-pressure steam (10-15 psi.) is supplied economically by flash steam from the blow tank.

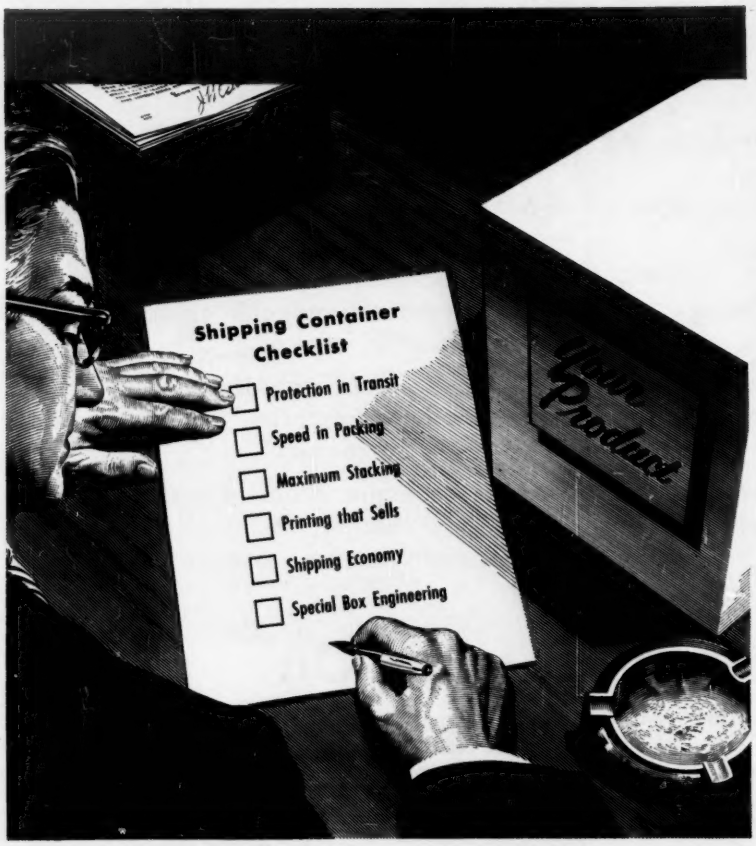
Heated chips are fed into the tall vertical digester through a specially balanced rotary valve, are mixed with fresh pulping liquor. The chip-liquor mixture is heated gradually as it flows by gravity through successive heating and cooking zones. Uniform heating—one of the secrets of uniform pulp quality—is aided by a slight hydrostatic pressure head (there is no vapor-filled head space) maintained within the digester.

From the bottom of the digester, cooked stock is blown into the top of an hourglass-shaped blow tank. The narrow middle section of this unit permits different temperatures to be maintained in each of the two chambers. The upper chamber is operated at 10-15 psi. for maximum heat recovery; the lower one is used to dilute and cool the stock for washing.

The entire operation from chip bin to washed-stock chest, says Kamyr, is almost completely automatic. But it still requires a skilled operator to control the blending of chip feed to compensate for variations and minimize operating adjustments.

Operating Savings: One of the greatest advantages of truly continuous pulping is its uniform demand on steam and electrical power sources. This is because it requires less hot liquor per unit weight of wood (2.5:1 vs. batch digester's 4:1 ratio). Thus, the Kamyr process requires little more than half the high-pressure steam

*The Kamyr process is offered in the U.S. by Kamyr, Inc. (Hudson Falls, N.Y.), and through its sales representatives, A. H. Lundberg, Inc. (Mercer Island, Wash.), the Swedish firm's agent for the Pacific Coast. Paper Machinery Ltd. (Montreal) distributes it in Canada.



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GAYLORD CONTAINER CORPORATION ★ ST. LOUIS

needed for batch digesters, says Lundberg, may save as much as $120/100 tons of pulp.

Steady operation is also the key to the low rate of corrosion in the continuous processing equipment. Thermal shock of alternate heating and cooling, together with the presence of air and boiling liquor, is believed to be a major cause of corrosion in batch digesters.

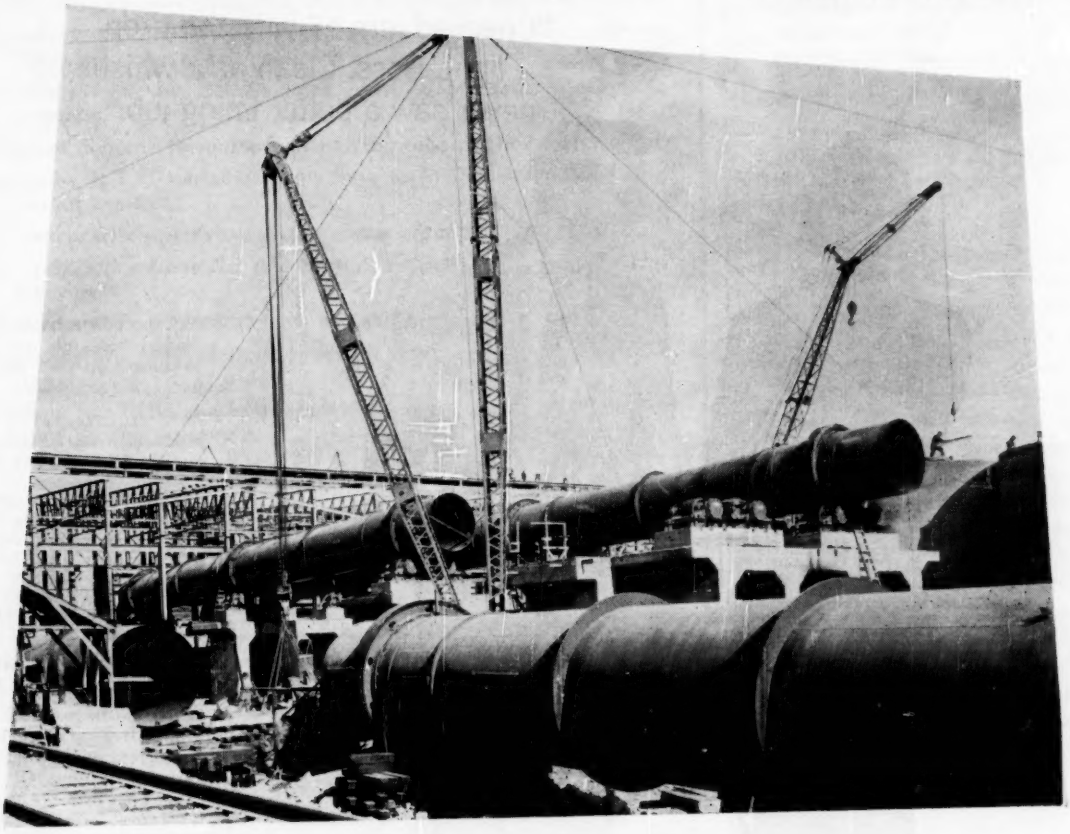
The continuous process can also chalk up a credit on economy of materials. By reducing screen-rejects by at least 50%, the Kamyr process increases the yield of high-quality pulps. And two Scandinavian plants have recently proved that continuous pulping can produce stronger pulps.

Because the digesters represent a relatively small part of the over-all capital cost of a bleached pulp mill, the Kamyr process has less of edge in this respect than it has in the area of operating costs. In small plants, the initial cost of a continuous digester is about the same as that of batch equipment. But for a large plant with digesters capable of handling 400 tons/day of pulp, says Lundberg, the cost of a Kamyr plant is considerably lower.

It's difficult to make a general cost comparison of the two methods, says Kamyr President Knut Dahl, because batch systems are variable. For example, a large mill may install six small batch digesters to gain operating flexibility, while a small mill would put in four larger units to get the same pulp capacity at lower cost. Continuous digestion equipment, on the other hand, is determined by throughput requirements. Typical costs of Kamyr plants range from about $600,000 for a 150-tons/day plant to $1 million for a 300-tons/day plant.

Expansion, Replacement: Despite advantages that the Kamyr process is demonstrating in the new continuous pulping plants, the batch method is assured of a prominent position in the field for some time to come. Reason: pulpers have a wealth of batch-processing know-how, have a big investment in batch equipment that is too valuable to scrap. And though some pulp producers may be reluctant to change their time-proved methods, chances are that many will make the switch to continuous pulping as expansion or replacement of existing batch plants becomes necessary.

...BUILDING THESE TAKES *BACKGROUND*



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13 REASONS WHY SALES MEETINGS FAIL

Talks, when poorly prepared, don't emphasize essential points.

Speakers unfamiliar with subject on agenda may rely on "catalog knowledge."

Speakers fail to demonstrate sales aids and relation to products.

Product demonstrations are either too technical or too general.

Speakers fail to tell salesmen where to look for customers and size of market.

Programs attempt to cover too much ground.

No printed resume is distributed to refresh memory after meeting.

Speakers show a general lack of enthusiasm.

Speeches are long-winded, speakers don't use snappy, attention-getting visual aids.

There's too little audience participation; talking "at" rather than "with" salesmen.

Speakers tell how the boss did it 30 years ago.

Pep talks center on criticism rather than giving "how-to-sell" suggestions.

Meeting room is crowded and ill-ventilated, with poor viewing arrangements.

Planning Makes the Meeting

"The general sales meeting is fast becoming a thing of the past. These get-togethers—which may cost up to $100,000—are too often a waste of time and money. They have become a parade ground, where company officials use the field force as a captive audience for a review of headquarters policies and procedures. So sales managers are turning to the smaller regional or district sales meetings." That's what Robert Gopel, assistant general sales manager of Koppers' American Aniline Division, told 550 sales managers at an American Management Assn. symposium in Chicago.

Gopel emphasizes three basic steps that are vital to the effectiveness of any meeting—steps that are too often neglected in setting up catch-all sales sessions.

- Plan carefully.
- Select a room and a seating arrangement that permit effective presentations.
- Organize subject matter to be sure that salesmen get all the information you want to present.

Too Much Too Fast? The need for planning, he says, is underscored by an often-heard salesmen's gripe: "I'm always mixed up when I leave a meeting. There's just too much stuff to digest in too short a time." But Gopel claims that confusion arises not from too much material but rather from sloppy organization that reflects lack of planning.

Sales meetings are always intended to provide inspiration along with information. But Gopel believes that planners should formulate definite objectives, specify products to be pushed, give facts on new price changes and clearly present information the salesman needs.

To plan correctly, he suggests using a mimeographed "meeting plan" form. At the top, the form lists location of meeting and main objective. Columns below organize information by date, speaker's time, specific ob-

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UNION CARBIDE CHEMICALS COMPANY
30 East 42nd Street
New York 17, New York

Gentlemen:

I have heard about the many and varied applications of Ucon fluids and lubricants. Please tell me how I can use them as:

☐.....Hydraulic fluids
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☐.....Metal-working fluids
☐.....Heat-transfer fluids
☐.....Grease components
☐.....Textile lubricants
☐.....Defoamers and De-emulsifiers
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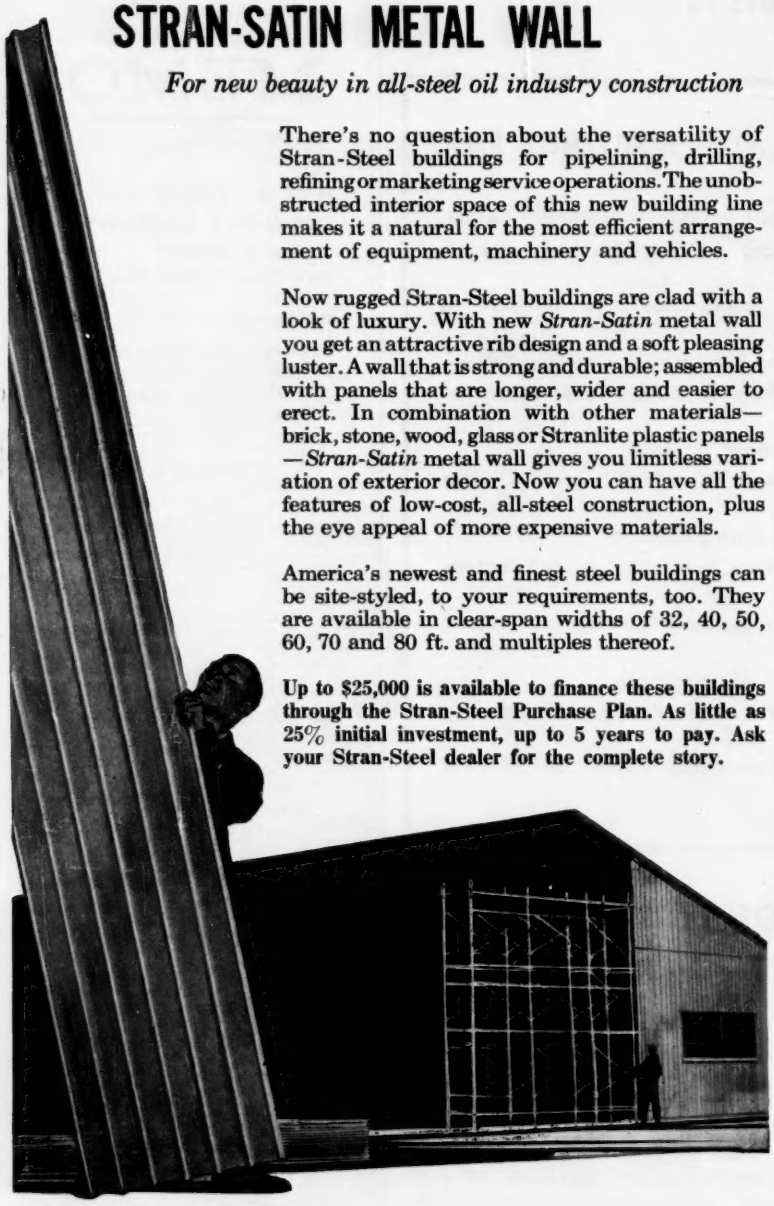

Here's where to obtain more information:
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Minneapolis 4, Minn., 708 S. 10th St.
New York 17, N. Y., 405 Lexington Ave.
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Koppers' Gopel: Keep poor speakers —even executives—away from dais.

jective, subject to be covered, method of presentation, visual aids required and general comments.

Write Them Down: "These methods seem elementary, but it's amazing how often they're neglected," Gopel says. "The best way to get your main objectives in mind is to write them down."

Emphasizing detail, Gopel advises meeting planners to run over an outline of specific subjects to be covered. "If the conference is on basic principles of salesmanship, have the courage to put down 'Basic Principles of Salesmanship' as the subject, and carry on from there," he says.

Next step, says Gopel: decide who will give the information to the salesmen. Most meetings are run by the sales manager. But if you're introducing a new product, the product manager might do the job better, he points out.

The Guts to Say So: It's essential, adds Gopel, that the person selected be able to express himself clearly. And he should studiously avoid bringing in top executives "who don't speak well, but have their say because no one has the guts to tell them so."

Even in the smaller district sales conferences, says Gopel, the conference mediator should be a top-notch leader, especially well-versed in the subject to be covered. Conference leaders, he contends, shouldn't answer questions but should "shoot questions to the men. Let them give

you the answers. Before the conference, write down 10 questions you will ask on each subject to be covered."

Gopel recommends role-playing as an effective way of pepping up a conference. "Ask salesmen for the presentation they plan to give a tough customer the next week. Take the men one at a time—have them demonstrate their ability to sell."

Thirty Years Late: "Every one of my company's sales engineers has gone through this 'test,' " says Gopel, "and some have been selling 35 and 40 years. To our amazement, the older men are the ones who say, 'why didn't I have this experience 30 years ago?' "

Visual impact ranks high in making a meeting a success. Visual factors take in everything from room layout (including lighting, seating plan) to presentation devices (blackboards, charts, models, projectors, slides, etc.). Make a studied effort to work visual presentations into your program, Gopel advises—almost any visual aid is better than none at all.

Gopel sums up the current sales situation this way: "Business is called good, but prices are high and profits are sagging. The sales situation is getting awfully tough out there. If your people are going to be effective competitors in their districts, you've got to do something about it pretty quick." More effective sales meetings, he believes, are a good beginning.

DATA DIGEST

• **Polyethylene:** Heat-seal characteristics of polyethylene films are presented in terms of time, temperature, resin-melt index, slip agents and resin density. U. S. Industrial Chemicals Co. (New York).

• **Copper sulfate:** Brochure gives detailed description of production methods in the modern copper sulfate plant, outlines statistics on quantities used in industry, agriculture and export, describes various grades produced, and lists detailed specifications for the various grades. Republic Chemical Corp. (New York).

• **Fatty acids:** New booklet provides specifications and characteristics of fatty acids, including stearic and oleic acids, hydrogenated fatty acids and glycerides, animal and vegetable fatty acids, and castor oil deriva-

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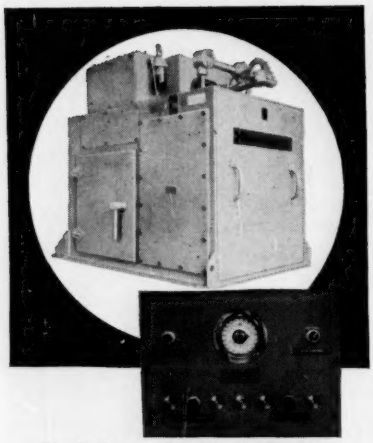

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SALES

tives. Emery Industries, Inc. (Cincinnati).

• **Detergents:** File folder lists 14 liquid and solid nonionic detergents according to their physical characteristics (hydrophilic-lipophilic values, solubility in various solvents, foaming, cloud point, etc.). Suggestions for application are outlined in another chart. Chemicals Division, Atlas Powder Co. (Wilmington, Del.).

• **General catalog:** Recently revised general products catalog lists information on properties and uses of 375 basic industrial, pharmaceutical and agricultural chemicals. Detailed information is in tabular form for easy reference. Dow Chemical Co. (Midland, Mich.).

• **Silicone coatings:** Brochure contains information on properties and performance of papers treated with silicone coatings. Subjects reviewed include noncontamination, permanence, water-repellency and nonmigration. Booklet contains several samples of one-side coated kraft, glassine and parchment for reader's inspection. Dow Corning Corp. (Midland, Mich.).

• **Benzyl chloride:** Safety data sheet discusses properties, hazards, control, employee safety, fire fighting, handling and storage, and waste disposal of benzyl chloride. Manufacturing Chemists' Assn. (Washington, D.C.).

• **Zinc oxides:** Illustrated booklet describes production of zinc oxides, provides technical data on their applications in rubber, paint, ceramic and other chemical industries; technical data section covers activation reinforcement, effects of trace elements, low heat generation and other areas. St. Joseph Lead Co. (New York).

• **Chlorinated paraffin:** Technical bulletin (3 pages) presents use of Chlorowax 70 as a plasticizing and reinforcing resin in neoprene compounds. Four major advantages of this resinous chlorinated paraffin are summarized and its principal applications listed. Diamond Alkali Co. (Cleveland).

• **Styrene compounds:** Brochure contains comparative properties chart of styrene molding compounds, available formulations, and granulations. Compounds charted include general-purpose, high flow-heat resistant, medium-, high- and superhigh-impact grades. Catalin Corp. of America (New York).

New uses found for **Metallic Oxide Pigments**

Today new product planners and production engineers are finding uses for the unique physical and chemical properties of metallic oxides which are surprisingly far afield from traditional usages.

Below is a review of their characteristics. Look them over. You may get the germ of an idea which will lead to the improvement of existing products . . . or to the reduction of new product manufacturing costs.

We'll be glad to cooperate with you in exploring the possibilities. Address Dept. 20, C. K. Williams & Co., Easton, Penna.

Name	Properties
Pure Red Iron Oxides and Kroma Reds	Fe_2O_3-98.5% SpG.-5.15 Color—Salmon to purplish red
Pure Yellow Iron Oxides	$Fe_2O_3.H_2O$-99% SpG-4.03 Color—Lemon to dark orange
Pure Black Iron Oxides	Fe_3O_4-96% min. SpG.-4.96 Color—Blue Black
Pure Chromium Oxides (and Hydrates)	Cr_2O_3-99% SpG.-5.20 Color—Light to dark green
Natural Oxides—Ochers, Umbers, Siennas, Metallic Browns, Red Oxides	Wide range of ferric oxide content and red, yellow and brown colors
Venetian Reds	Fe_2O_3-40% SpG.-3.45 Color—Light to med. red
Cuprous Oxide	Cu_2O-97% min.
Extenders—Barytes, Calcium Carbonate, Calcium Sulfate, Silica	Wide range

Characteristics

Composition: The basic colors of the iron and chromium oxides are determined by chemical composition. Reds are ferric oxide (Fe_2O_3); yellows, hydrated ferric oxide ($Fe_2O_3.H_2O$); blacks, ferro-ferric oxide (Fe_3O_4); and greens, chromic oxide (Cr_2O_3). All these compounds are chemically stable and light permanent.

Particle Shape: Physical properties such as oil absorption and suspension characteristics are dependent on particle shape, controlled by manufacturing processes.

Size: Color range is controlled by particle size—average size increases as color darkens. Uniformity of size determines brightness.

Purity: Freedom from impurities is essential for superior pigment properties and to prevent deleterious effects in end-products. Control of soluble salts, manganese and copper content are an important part of the Williams manufacturing operation.

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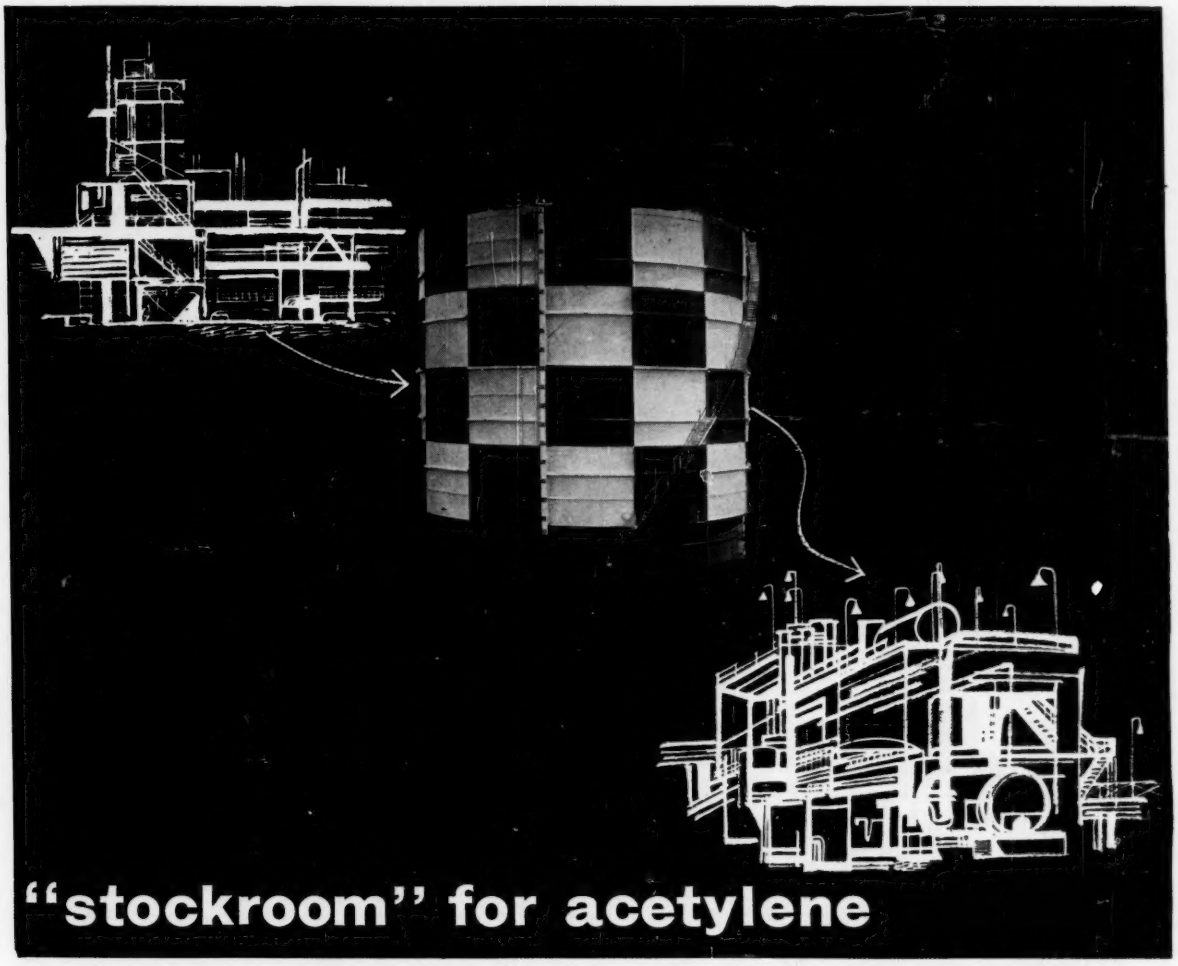

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Ever since the Linde Company's new acetylene plant in Montague, Michigan went "on stream", a new 100,000-cubic-foot Wiggins Gasholder has played a vital role in the operation. Every cubic foot of acetylene produced passes through the "stockroom" on its way to DuPont for use in the production of Neoprene. The gasholder provides acetylene storage and serves as surge capacity to enable Linde to satisfy both normal and emergency requirements.

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CONTINUOUS FLOW
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The right filtration equipment for you is the one that comes closest to meeting your particular combination of factors.

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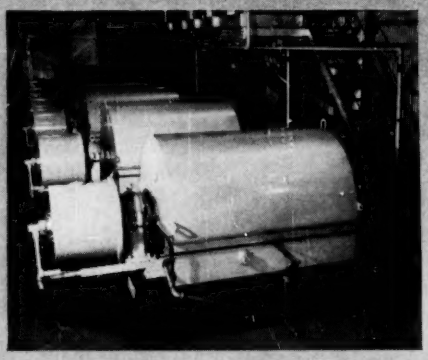

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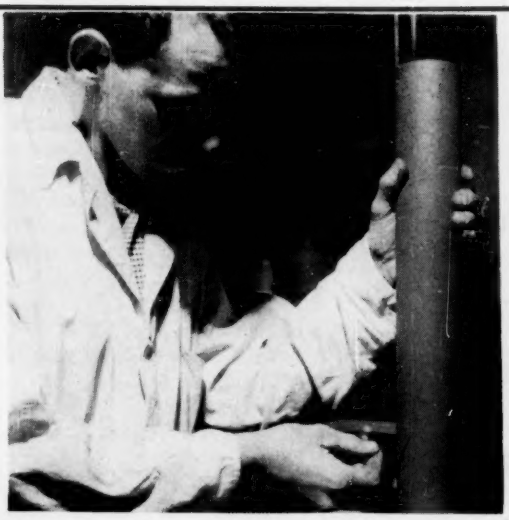
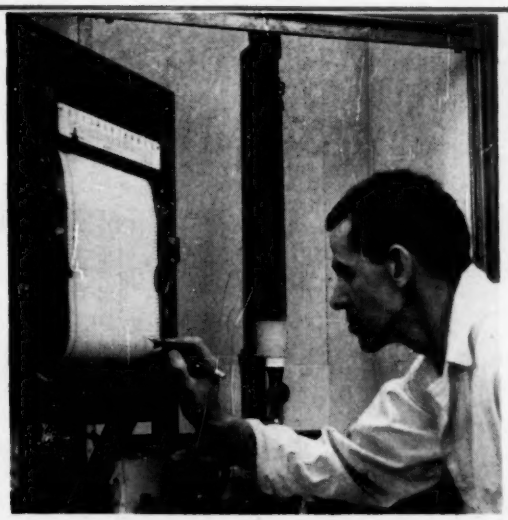
But you don't have to take anybody's word for that. Submit a pilot size sample of *your* feed slurry for actual running test at the Bird Research and Development Center. All factors and all types of filtration will be considered before a recommendation is made. Then, whether it's a Bird Centrifugal Filter or some other type, you'll be absolutely certain of the one best filter for the job *in advance* of your equipment investment.

BIRD

MACHINE COMPANY





Thermocouples on test pipe (left) show temperature as heat changes paint's color (right).

Esso research group* checks test result (left); converted paint is removed by wire-brushing.

Turncoat Paints Expose Refinery Hot Spots

Ask paint technologists about the heat-caused change in paint color shown in the above photo sequence and they'll probably say it is an old, but little used, trick. This week, the trick is arousing interest as a new maintenance and safety tool in the wake of news that Esso and Socony Mobil have successfully adapted it to rapid detection of overheating equipment and that their subsidiaries are ready to sell temperature-indicating paints.

Until the oil companies picked up the idea, such paints were expensive, rarely used—and for these reasons, not widely known: the first on the market were made from German (BASF) pigments or imported from England. Tempil Corp. (New York), for example, has marketed a British line, called Thermindex, for almost 20 years at about $30/pint; it added its own line, called Temp-Alarm, about 10 years ago at $25 a gal. (for color changes to 200 F) and $40/gal. (for color changes to 900 F). Tempil sells its paints mainly as research aids and for a few specialized applications (e.g., on cement kilns to detect refractory-lining wear).

*Left to right: technician Lloyd, group leader Canevari, Delahunt.

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Write for other suggested uses and more detailed information.

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PRODUCTION

Hot Spots: Esso Research & Engineering moved into the picture about two years ago in an effort to solve the problem of detecting hot spots (overheated areas) on reaction vessels. ER&E settled on paint specifications, farmed out the actual formulating to Resin Research Laboratories (Newark, N.J.). The heat-sensitive paint it devised, Temperature Indicating Blue 9775, is manufactured by Specialty Products Division of ER&E's affiliate, Humble Oil & Refining Co. (Houston, Tex.). The paint had about one year of weathering under process conditions at Esso Standard's now-closed Baltimore refinery, is now on operating units at other refineries.

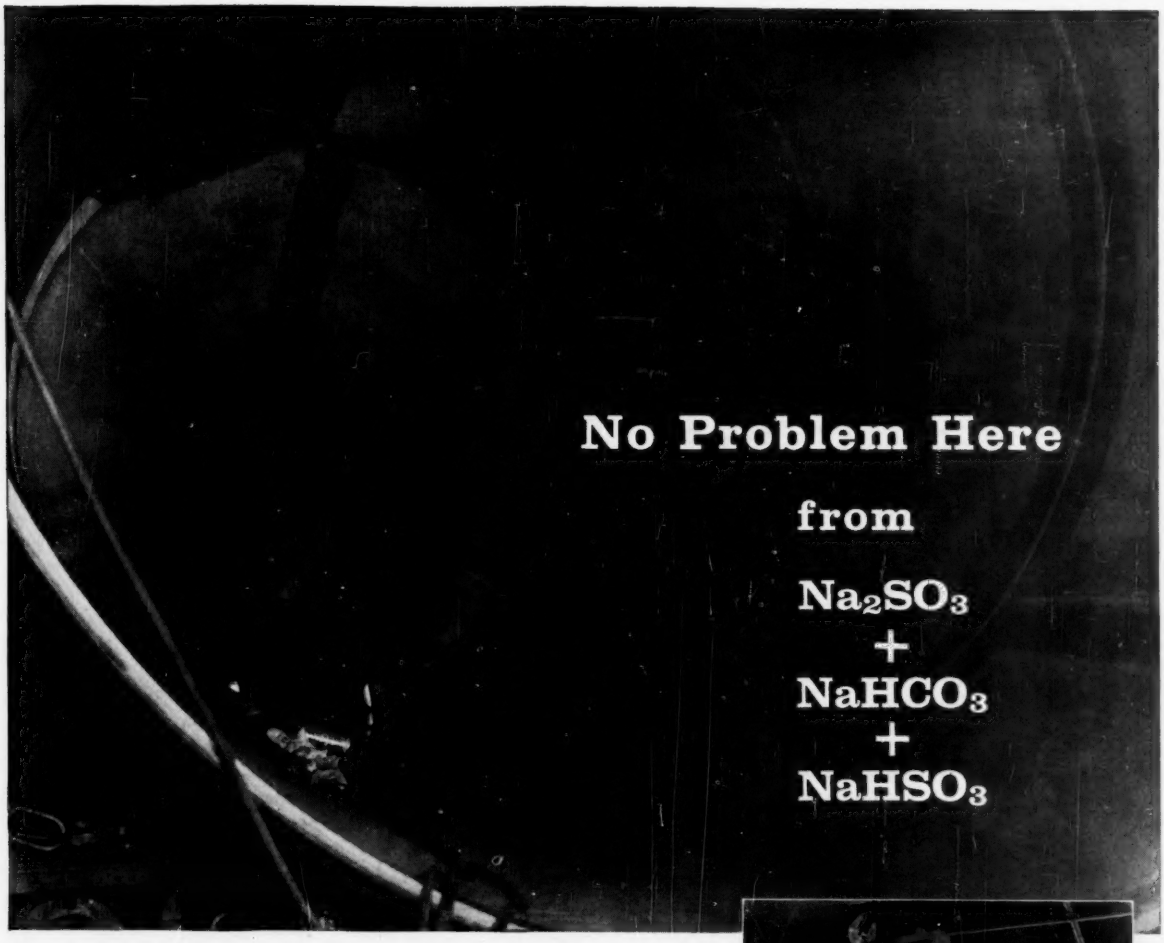
Socony Mobil put its subsidiary, Socony Paint Products Co. (Metuchen, N.J.) to work on the same paint problem about a year ago. The resultant product, Socony Paint's 37-B-1, has been in refinery use at Paulsboro since June, is also being used at Buffalo.

Behind the paint development: the trend toward higher temperatures and pressures (e.g., 900 F, 650 psi.) in reforming operations. A way was needed to indicate when a worn lining of the reformer-reactor subjected the steel shell to conditions that could cause hydrogen embrittlement, shell weakening. ER&E and Socony engineers determined that when temperature at any point on the shell reached 600 F, it was plain there had been a lining failure, and Shell cooling was needed. Pyrometers, other types of indicators* that could not cover the entire surface area, couldn't be used. ER&E decided a paint would do the trick, developed one with a color-conversion temperature of 575 F; Socony settled on one with a wider safety margin—500 F. And since both have paintmaking firms within the over-all organization, they made the natural move of developing their own paints.

Other conversion temperatures might be made available with minor formulation revisions, if called for. For example, ER&E's Gerry Canevari, in charge of the paint project, says that the group came up with a 650 F conversion-temperature paint.

Both Esso's and Socony's paint undergoes an abrupt color change from blue to white at the conversion temperature. "We wanted a paint that

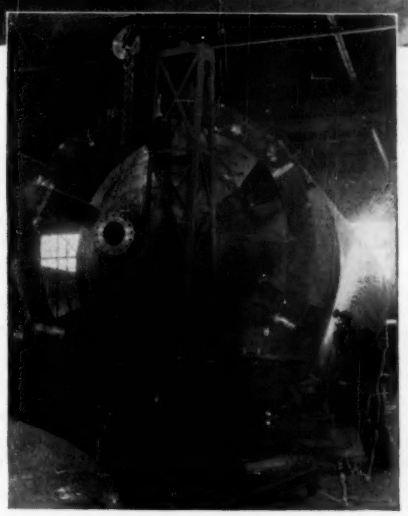
*For example, Tempil makes a color-changing crayon (Tempilstik) and liquid (Tempilaq) that dry after coating, reliquefy at critical temperature.



How Finch, Pruyn Avoids Costly Corrosion Problems In Huge 5-Story Digester and Blow Tank for New Neutral Sulphite Process at Glens Falls, N. Y.

The neutral sulphite process at Finch, Pruyn & Co., Inc. requires a corrosive cooking liquor for converting hardwood into pulp to make bright, high-strength and economical printing and converting papers. The corrosion problem posed by this liquor in a giant 3,500 cu. ft. high-temperature digester and in a triple-charge blow tank was met with a tailored combination of steels, fabricated by Graver. The digester, designed to withstand a pressure of 200 psig, was made of Type 316 ELC 20% stainless clad on ASTM A-212 Grade B firebox quality steel. The blow tank was similarly constructed.

For this design by Chas. T. Main, Inc. of Boston, Graver's many years of experience in forming and welding stainless, stainless clad and other alloys assure long life and trouble-free operation. The Finch, Pruyn installation is another example of processing equipment being skillfully fabricated by Graver to combat destructive and costly corrosion.



The 93,400-lb digester, shop fabricated under Graver's exacting standards of craftsmanship, is 11½′ in diameter and 57′ 8⅛″ high overall.

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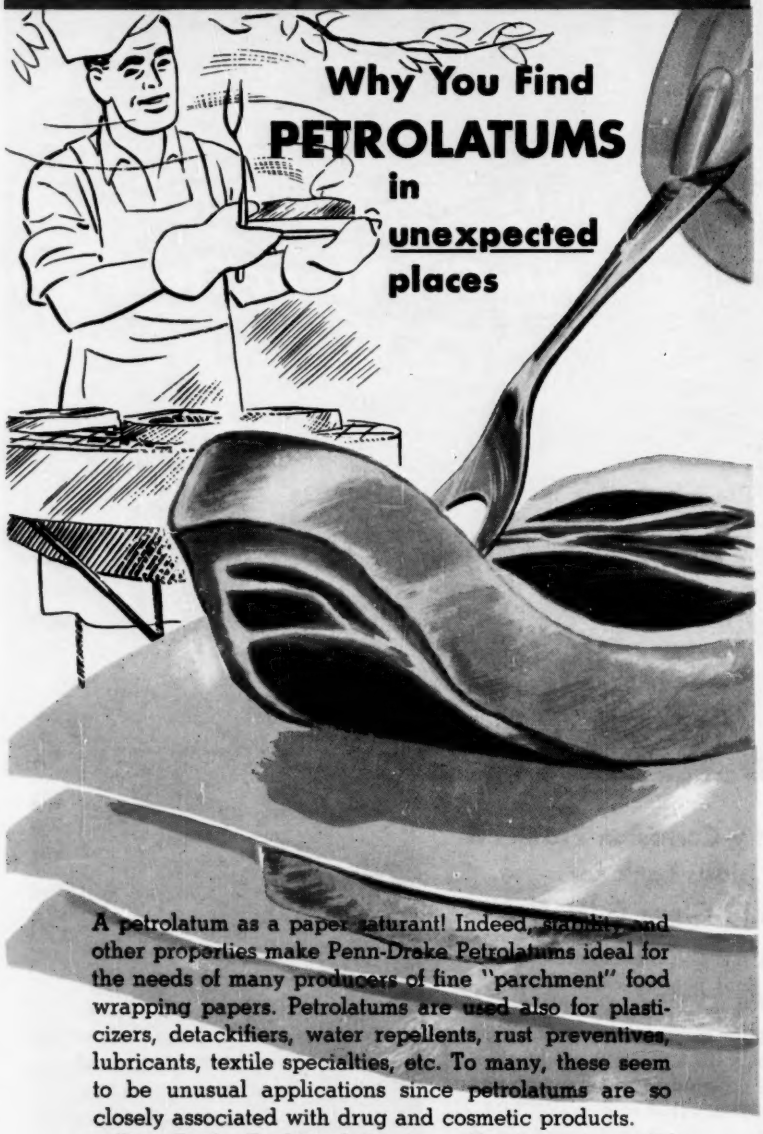

A petrolatum as a paper saturant! Indeed, stability and other properties make Penn-Drake Petrolatums ideal for the needs of many producers of fine "parchment" food wrapping papers. Petrolatums are used also for plasticizers, detackifiers, water repellents, rust preventives, lubricants, textile specialties, etc. To many, these seem to be unusual applications since petrolatums are so closely associated with drug and cosmetic products.

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would show contrast, be discernible at night," says Canevari.

One problem with some temperature-indicating paints: color change is so gradual that slight modifications in color require interpretation. Socony Paint's vice-president, Bob Koppenhafer, says the firm's paint lightens in color between 400 and 450 F. And ER&E's Jack Delahunt reports a certain time lag in color change—specification calls for ¾-hour maximum—although on a thin plate, the color change is almost instantaneous. But both groups report satisfactory field performance.

Cost Difference: Biggest difference between the Esso and Socony paints appears to be cost. Humble's price for Blue 9775 is $14.50/gal.; Socony Paint's price for 37-B-1 is $6/gal.

But there is also an inherent formula difference between the paints. The Esso paint is said to be silicone-alkyd based (Charles West, president of Resin Research, says "organometallic resin" is a more correct description). It was developed to be equivalent in cost to many high-temperature paints, is expected to have excellent weathering qualities. Socony did not feel that a silicone-base paint was required, developed an alkyd that is also said to have good weathering qualities.

For those interested in a double color change, another new entry in the field, Matcote Co. (Houston, Tex.), offers two silicone-base temperature indicating paints at $16.50/gal. Both (Matcote 701 and 702) change from green to blue at 400 F, blue to white at 590-600 F. The white film remains intact to about 950 F.

Biggest Cost: Both ER&E and Socony Paint agree that in painting equipment, labor cost, not the paint cost, is by far the more expensive factor involved. Both new paints offer labor savings in that they can be applied over unprimed base metal that has been wire-brushed. Another advantage: after color change, the paints are easily removed by wire-brushing.

But regardless of the valuable application features of the newly developed temperature-indicating paints, neither ER&E nor Socony Paint looks for large-quantity sales of them. Whether they will gain and sustain acceptance beyond the oil refineries remains to be seen. But if nothing else, the oil companies have solved their own problems.

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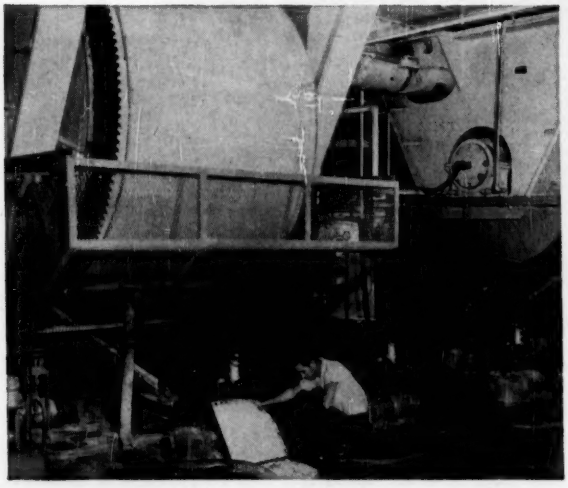

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Technology Newsletter

CHEMICAL WEEK
December 28, 1957

Full technical details on Britain's work with Zeta fusion apparatus will be released early next year, according to statements made to the British House of Commons last week. The British have made some big strides in their effort to control fusion reactions. But in terms of dollar expenditures, the Zeta program pales in comparison with Project Sherwood, the U.S. counterpart. The British have probably spent no more than $500,000 so far, while the U.S. expenditure on Sherwood is over $23 million.

•

Controlled fusion is also the goal of General Electric. The company now reveals it has had a "substantial" program under way for over a year. At the same time, Guy Suits, GE's vice-president and director of research, offers this timetable for technological progress: five years more will be required to make a realistic appraisal of the process; 10 years to bring it to a point of technical feasibility and 10 more years before pilot-plant production could get started.

The most important progress made so far in controlling fusion, Suits feels, is the magnetic containment concept.

•

The segregation process for treating copper ores is whipping up interest in the Southwest. The U.S. Bureau of Mines' Southwest Experiment Station at Tucson, Ariz., has just reported some encouraging results on the work it has done on the low-grade ore common in the Southwest. Their report was to the Arizona sectional meeting of the American Institute of Mining, Metallurgical and Petroleum Engineers in Tucson. Small-scale tests have been so promising that USBM would like to put up a 50-tons/day pilot plant to get more accurate cost data.

Process involves the heating (at 700 C) of minus 10 mesh ore with sodium chloride and coke (or other carbonaceous materials). This produces fine flake copper, which can be recovered by conventional xanthate flotation methods. It's an old process; it was developed and patented in the '20s by Mineral Separations Co., Ltd. (London, England). But this early work was on ores assaying 5-6% copper. In the Southwest, the ores assay less than 2%; some contain only 0.5-1.0%.

•

Now there's a British licensee for the sucrose ester process developed by Foster Snell's Lloyd Osipow for the Sugar Research Foundation (*CW Technology Newsletter, Dec. 1, '56*). Howards of Ilford, Ltd. (Ilford, Essex), will make the di-esters as emulsifiers for food and other applications, will market them under the Sorbester S tradename.

A pilot-scale underground coal gasification project should start up next December in England. Humphreys and Glasgow Ltd., which took over responsibility for the National Coal Board's work at Newton Spinney

(near Chesterfield) expects to be supplying a low-caloric gas produced by burning the coal in air. The heat content of the gas, to be used for generation of electricity in a nearby power station, could be stepped up by using oxygen, but this poses some hard technical problems.

Results of the pilot-plant study will put the National Coal Board in a position to decide whether or not to go ahead on a large-scale underground gasification plant.

•

Colored prints from a black-and-white negative? Albert Baez, of Stanford University, and Edward Fisher, of the University of Redlands, Calif., explained last week to the American Physical Society meeting of Stanford how it could be done. The technique involves Fresnel rings. The object to be photographed is illuminated with a point source to produce rings on a negative. These serve as a guide for printing in color, using conventional color dyes. The system in its present form doesn't produce good color though, and is a long way from being practical right now.

•

P. R. Mallory has developed a new powdered metallurgy technique. Called Steelmet, it's said to be capable of producing intricate parts with properties comparable to those of machined-wrought parts. Illustrating the sizable savings, Mallory tells of one part being sold now to a customer for 25¢ that would cost more than $1 if made as a wrought part.

Parts now available are being made in a pilot plant. Details of the work were presented before the American Assn. for the Advancement of Science in Indianapolis this week by H. Sigurdson, director of research and engineering for Mallory's Metallurgical Division.

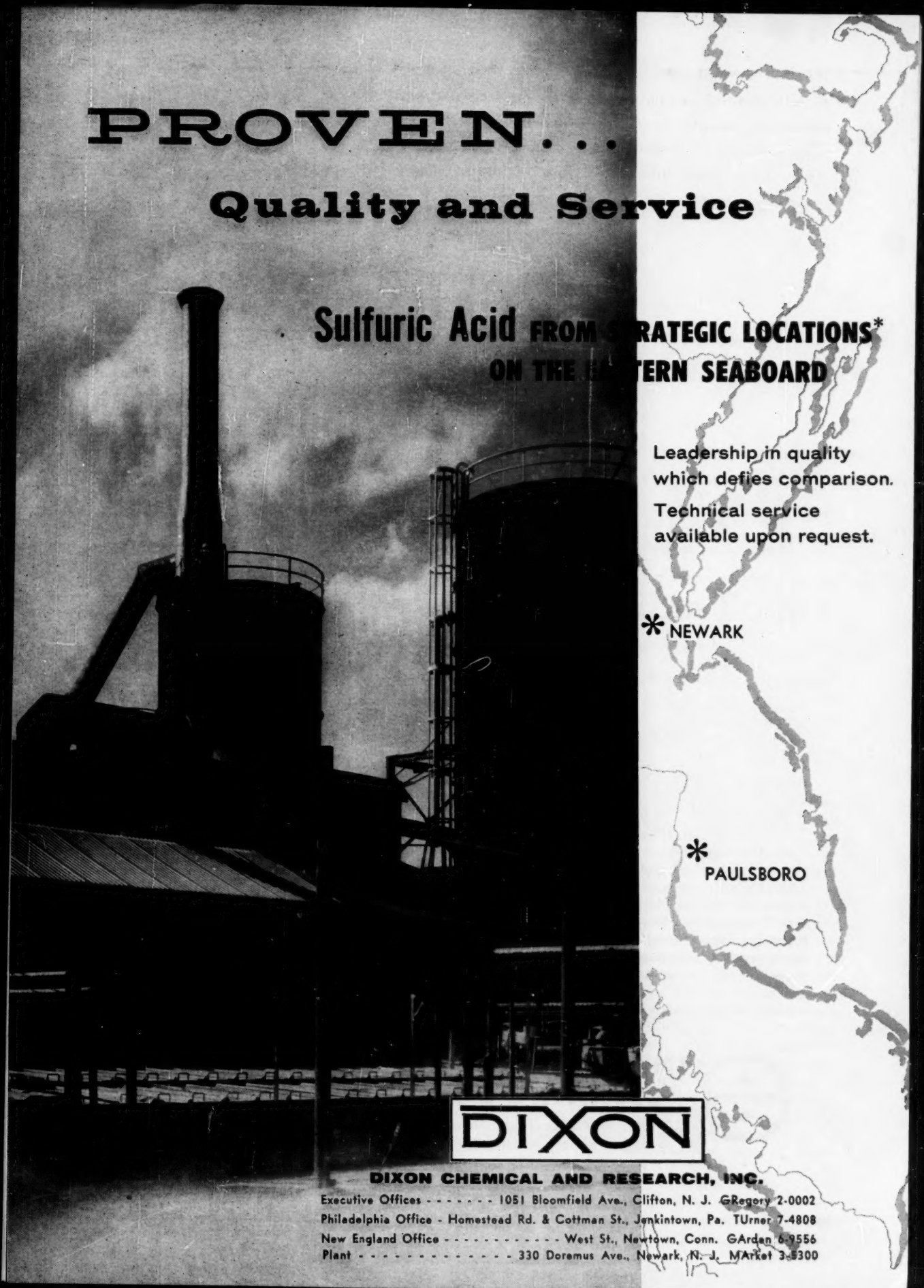
•

Imperial Chemical Industries will store domestic gas underground in a specially constructed cavity in a salt deposit. It will make the cavity by dissolving the salt as brine. Located about 1,200 ft. below the estuary of the Tees River at Port Clarence, Eng., the pit will hold 10 million cu. ft. of coal gas under pressure.

ICI admits the costs will be heavy. But it feels the method will be a lot cheaper than conventional storage.

•

Transistors capable of operating at 1400 C may soon be made by a new technique developed by Air Force Cambridge Research Center (Bedford, Mass.). Key to the new high-temperature semiconductors: silicon carbide crystals, purified by resublimation, recrystallized by vapor deposition. Working on its own and, under research contracts, with Westinghouse and Armour Research, AFCRC has produced transistors that operate at 700 C in the laboratory. Operation at 1400 C (that's 5-6 times higher than the operating limit of present transistors) and at frequencies above 100 mc. can be attained, AFCRC believes, with the help of recently developed, conventional fabricating techniques.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MRI's Kinsell's research on linoleic, arachidonic acid sheds . . .

New Light on Edible Fats

Researchers studying edible fats will soon have new clinical data to help clear up the connection between fat diets and blood cholesterol levels. So far, the relationship has been subject to dispute, as has the supposition that high cholesterol levels ultimately lead to heart trouble (*CW, March 23, p. 58*).

This data will come from Laurance Kinsell, director of the Institute for Metabolic Research, Highland Alameda County Hospital (Oakland, Calif.). He is readying formal publication of new findings that confirm linoleic acid as the constituent in vegetable fats that are active in lowering cholesterol levels. And he has turned up evidence that an arachidonic acid-phosphatide mixture is even more effective than linoleic acid.

Pinpointing linoleic's role is, in Kinsell's opinion, the more important discovery. While linoleic was believed to lower cholesterol, the acid has only recently become available in sufficient purity for confirmatory tests. Kinsell fed purified ethyl and glycerol esters of linoleic acid to various individuals, found he could produce predictable changes in their blood cholesterol levels. Oleic acid preparations, on the other hand, did not duplicate these effects.

Kinsell is somewhat more cautious about claims for arachidonic acid. He will need pure arachidonic acid for future confirmatory tests—and the pure acid is difficult to produce. Also, it is highly unstable.

Neither discovery is necessarily to be construed as the answer to averting heart disease. Kinsell believes there's more to the problem than taking daily doses of unsaturated fatty acids "to duck heart trouble" (although some other investigators differ with him on this). Nor does Kinsell think a low fat diet is the answer. Instead, he suggests evidence that points to "palatable mixed diets, high in essential fatty acids" as the safest dietary course to follow.

A lot of work remains to be done on correlating the effect of unsaturated fatty acids on the cholesterol level with the incidence and severity of coronary disease. The complexity of such research is underscored by Albert Holland, Jr., director of the Bureau of Medicine, Food & Drug Administration, U.S. Dept. of Health, Education & Welfare.

Cause or Effect: Holland asks: "Is

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NO. 43

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	1,200	14,000

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the elevated cholesterol level in a patient with coronary artery disease cause or effect? If it's cause, is the total cholesterol the important factor or some specific lipoprotein fraction? If one lowers cholesterol levels, may one not be doing some as-yet-undiscovered damage of another type? There is some animal evidence that prolonged diets high in polyunsaturated acids may precipitate deficiency of certain fat-soluble vitamins. Will this occur in man? Will we adversely affect the levels of the hormones derived from cholesterol? More work is urgently needed to answer these various questions and to unravel the interrelated problems of the roles of exercise and of carbohydrates, proteins and total caloric intake."

Holland is against drastic dietary changes, says FDA is presently "maintaining an open mind on the subject," feels "products containing polyunsaturated fatty acids should be labeled merely as simple dietary supplements." FDA is not, however, making a firm stand against such products when they are substituted for other fats in high-risk arteriosclerotic patients under medical supervision. But it does object to representation of such fatty acids as "essential," or to any representations to the general public that the products have "either therapeutic or prophylactic value."

That's pretty much the attitude of edible-fat producers. They're generally willing to modify their products if it should become necessary. But they want (and are supporting) a lot more research to see if any changes are justified. Kinsell's newest research (his work in the field dates back to 1950) is turning up the kind of concrete evidence that could have a big influence on future dietary fats.

Rocket Progress

Something new in rocket fuels—a solid propellent possibly based on decaborane—is being developed by Callery Chemical Co. According to the firm's vice-president—operations, William Schechter, the new fuel should make possible a "superefficient rocket." That's because it permits use of a high-energy boron-carbon-hydrogen compound in combination with the most efficient rocket design. (A rocket using a solid propellent requires no fuel transfer mechanism, is conse-

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by **INTERNATIONAL SALT COMPANY, INC.**—America's largest producer of salt

How to Find the Strength of Salt Brines—Accurately

In most of today's plants, the type of hydrometer called a Salometer can generally be used to measure the strength of salt brines most accurately. This device (similar in principle to the hydrometer which checks the condition of your car's battery) is convenient to use—and its scale permits fast calculations for a variety of plant needs. The Salometer scale reads from 0° in pure water to 100° in saturated brine, with each degree representing a percentage of fully saturated brine.

Using the Salometer with maximum accuracy, however, isn't just a matter of reading the scale. A number of simple precautions must also be taken to make sure the Salometer records correct brine strength. Here they are:

1. Check the temperature of the brine. Since most Salometers are calibrated for reading at 60° F., brine temperature should be kept at this level during testing. When other brine temperatures are encountered, it is necessary to use the following table of simple correction factors. These will help provide a completely accurate measurement of brine strength.

APPROXIMATE CORRECTION IN SALOMETER DEGREES

Observed Salometer reading	Subtract per degree below 60° F.	Add per degree above 60° F.
0 to 10	0.049	0.060
11 to 20	0.064	0.082
21 to 30	0.077	0.094
31 to 40	0.087	0.103
41 to 50	0.095	0.112
51 to 60	0.102	0.118
61 to 70	0.107	0.123
71 to 80	0.112	0.128
81 to 90	0.116	0.131
91 to 100	0.120	0.134

For measuring cold brines, such as those used in meat-packing plants, special 38° F. Salometers may be used. Special temperature-correction factors are available when using this type of Salometer to test brines above or below 38° F.

2. Brine should be tested only in a straight-walled cylinder made of clear glass—set on a level surface. Any moisture that collects on the outside of the cylinder should be wiped off before testing procedures start.

3. Salometer stem must be thoroughly dry, clean, and free from grease or caked salt crystals. Also, the Salometer should not touch the sides of the cylinder when readings are taken. It should be read with the stem in a vertical position.

4. Check new Salometers by placing them first in clear water; reading should be 0° S. Then empty the cylinder, rinse with a saturated salt solution, and refill with fully saturated brine; reading should be 100° S. Both water and brine should be at 60° F.

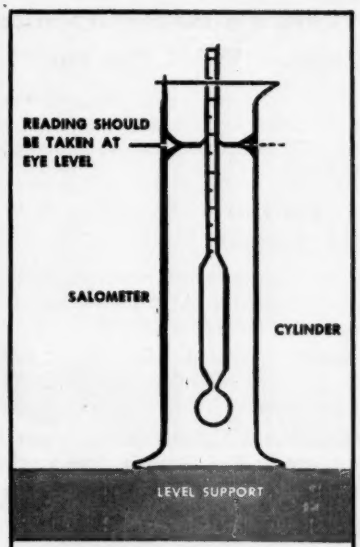

Illustration showing the proper eye level for reading a free-floating Salometer in a straight-walled glass cylinder.

5. Correct reading technique. Brine tends to rise along the sides of a glass cylinder, forming a concave surface known as a meniscus. For correct reading, the eye should be brought to a point level with the *bottom* of this meniscus. Errors of two or three degrees are possible if reading is taken at the point where the brine has risen along the sides of the cylinder.

Special Salometers. In the canning industry, where brine is used for quality grading, a different type of Salometer is often used. It's graduated on a scale where 100° S. represents brine containing 25% salt, instead of the normal 26.395%. Special hydrometers may also be used in the tanning or chemical industries. But the same procedures outlined here must always be followed when brine is to be tested—no matter what type of hydrometer a plant uses.

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Through skilled and experienced "Salt Specialists," International can help you get greater efficiency and economy from the salt or brine you use. International produces both Sterling Evaporated and Sterling Rock Salt in all types and sizes. And we also make automatic dissolvers in metal or plastic for both kinds of salt. So we can recommend the type and size of salt most perfectly suited to your needs.

If you'd like help on any problem concerning salt or brine—or further information on testing brine strength—contact your nearest International sales office.

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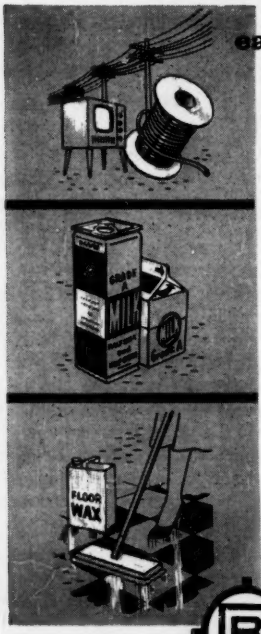

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RESEARCH

quently lighter, less complicated.)

So far, Callery has been making liquid alkyl boranes, called HiCal, which Schechter considers "the most efficient chemical fuel that it is possible to develop in practical quantities. The next step is nuclear fission or fusion." But the firm says it intends to devote a "great deal of time and research" to its new fuel, explains its experience in developing Hi-Cal will contribute directly to development of the new propellent. Callery will produce decaborane (and other chemicals) in a new plant now under construction at Lawrence, Kan. For the present, Callery calls its new fuel "solid HiCal."

Olin Mathieson has also begun expansion of its facilities for developing high-energy solid propellents at its Ordill Works, near Marion, Ill. (*CW Technology Newsletter, July 13*). These fuels are also believed to be based on decaborane.

PRODUCTS

Carpet Yarn: Courtaulds Ltd. (London) reports it has developed a chemically treated protein fiber that is resistant to common moths and carpet beetles. Called Fibrolane, it's for use in carpets.

•

Boron Entries: K&K Laboratories Inc. (Long Island City, N.Y.) now offers trimethyl borine, tributyl borine, triisopropyl borine, and crystalline boron triiodide in research quantities.

EXPANSION

• Georgia Pulp and Paper Assn. (Brunswick, Ga.), newly formed by eight major Georgia pulp and paper companies, will coordinate its members' research in air and water pollution.

• A major coal research center is planned for Pittsburgh. It will be headed by A. A. Potter, president of Bituminous Coal Research, Inc., consolidating that organization's facilities in Columbus, O., Pittsburgh, and Washington, D.C.

• General Motors Corp. will build a laboratory at Miami, Fla., for research and testing of effects of weather on automobile finishes.

• Ground has been broken for a new $500,000 process development laboratory at Shell Development Co.'s (Emeryville, Calif.) research center.

QUIZ
For Multiwall Bag Buyers

"How Does Your Packaging Operation Rate?"

1 Is your bag correctly sized for your product?
2 Is your bag properly constructed for your product?
3 If loss of product is caused by deterioration, would special protective sheets help to reduce such loss?
4 Is the total cost of your bag out of proportion to the selling price of your product?
5 Does your product cost warrant redesigning your bag to merchandise your product more effectively?
6 Are you using the most economical filling machine available for packaging?
7 Are your current suppliers giving you the service you desire?
8 Are your suppliers integrated and capable of maintaining dependable service at all times, under all conditions?
9 Are your suppliers' representatives qualified to help you with your packaging, sales promotion and marketing?

Perhaps we may be able to help you to arrive at the right answers in order to achieve higher production at lower costs.

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☐ O.K. Kraft... Help me to answer your Quiz. Please have representative call.

COMPANY_____

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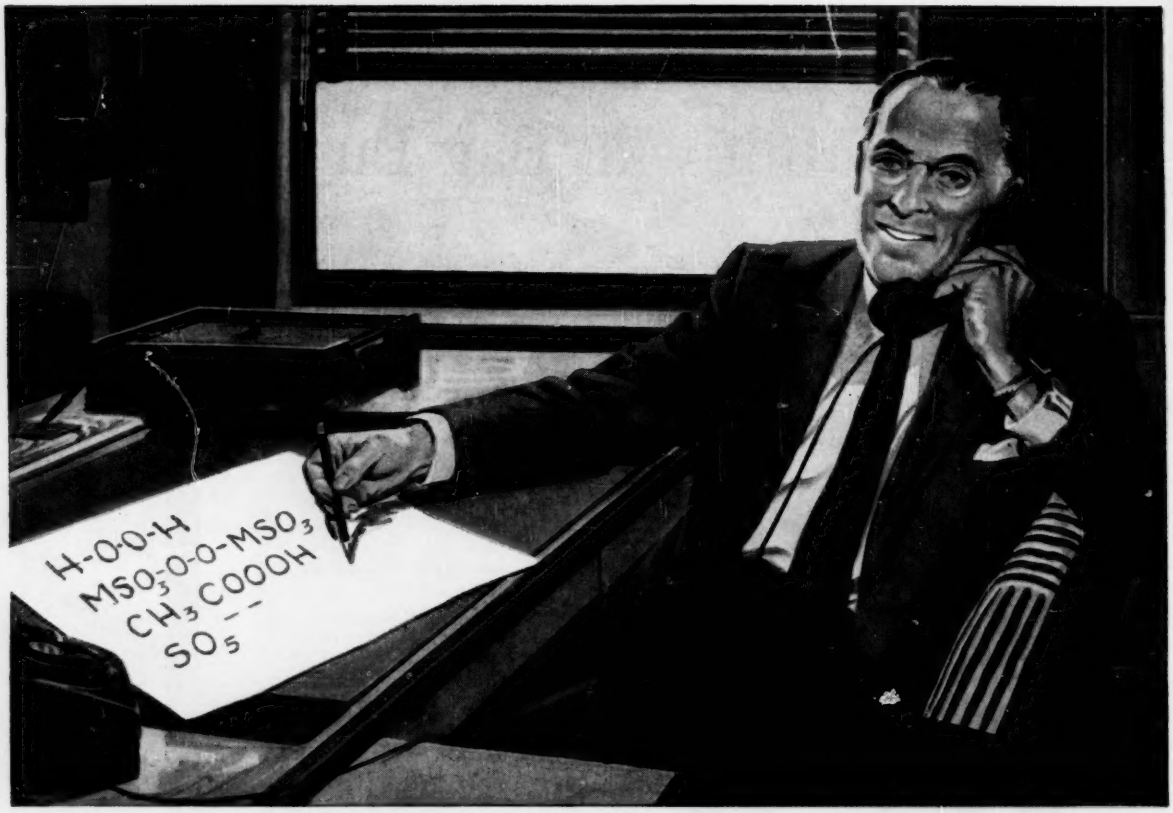
PRODUCT MFD._____

NAME_____



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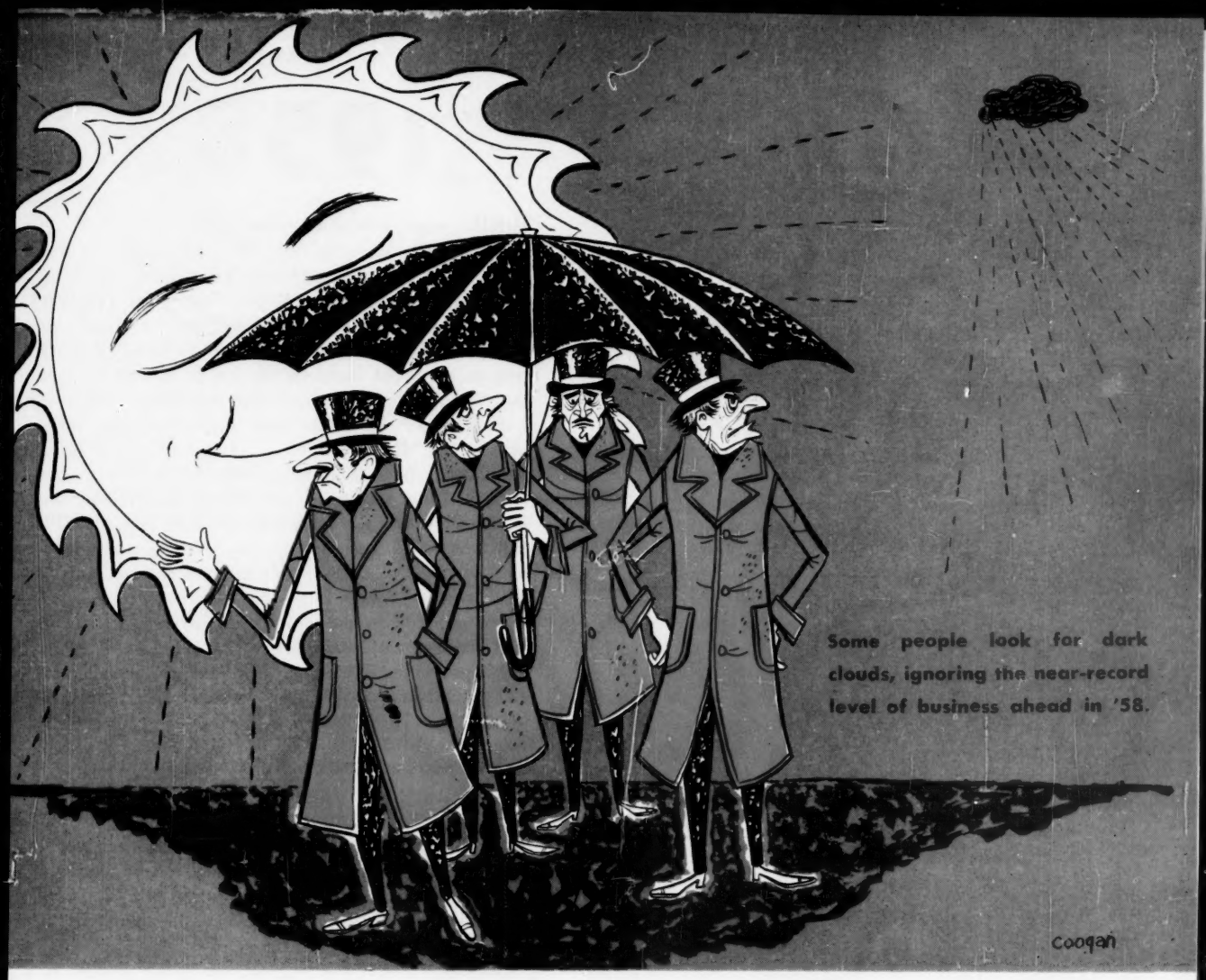


Some people look for dark clouds, ignoring the near-record level of business ahead in '58.

1958 Clouds in a Bright Forecast

For the chemical and allied industries, 1958 may not turn out to be a record-breaker. But it will rate among the best in history for sales, production, technological progress—and profits. This despite recent sluggish activity in some areas of the nation's economy.

During the new year the problem of how to fatten profits after taxes will continue to be the industry's biggest challenge.

Labor, transportation and equipment costs will go up to add to the pressure on profits. But profits—before and after taxes—will be held to '57 levels (or perhaps somewhat lower) by careful re-evaluation of physical inventory positions before new long-term commitments are made, by greater emphasis on operating efficiencies and by price increases.

Companies will tighten up on costs, reorganize departments, weed more unprofitable items out of their product lines, make better use of personnel. These moves, aimed at increased operating efficiency, will begin paying off late in '58—eventually they will show up in wider profit margins.

For the immediate future, however, expenses will continue to run high, net returns lower. Some succor will come from early price increases, but stronger buyer resistance will be a '58 factor with which to contend.

The Big Picture

The country's gross national product—basic benchmark of business—should climb some $7 billion next year, hit $441 billion, compared with this year's $434 billion. Industrial output as a whole, however, might drop off some. Measured by the Federal Reserve Board Index, '57 checked out at 143 (1947-49 =100). For '58, the figure probably will be 140. Reason: capital investment is expected to slip about 7%—down to $34.5 billion from '57's $37 billion. The '58 estimate for the

Increased R&D spending is ahead in '58.

chemical process industries: about $4 billion for new plants and equipment. Strongest rein on bigger budgets for new capital spending: the profit outlook.

Dollar value of the CPI's output is expected to top $78 billion in '58. That's 3% higher than the record-breaking $75.5 billion set in '57—an added indication that the new year won't be as dark as some expect.

For chemicals and allied products, sales may well edge above $25 billion in '58. The industry had expected to reach that figure during the current year, but latest statistics peg '57 chemical-and-allied-products sales at approximately $24.5 billion.

Capital spending by chemical manufacturers will be down a little in '58—probably not more than 4%. This compares with the anticipated 7% reduction for all industries. But chemical producers will make economies without dipping into research funds. Economizing will be concentrated at the manufacturing level. Research will be spurred by new emphasis on science, nourished by sales of a plethora of new products.

In the next 12 months chemical makers plan to pour about $550 million into research and development, over 4% more than this year and a 50% increase over such expenditures only five years ago. A recent McGraw-Hill business survey reported that "over one-third of all manufacturing industries were planning substantial capital outlays after 1959, based on new products they hope to develop in the next two years."

1958

Manpower won't be very much of a problem next year. There'll be more engineers job-hunting, especially in the early months of the year. Later on, however, when defense spending picks up, this situation will change. With chemical firms still spending high for new or improved installations, and adding to research budgets, the over-all need for technical people will grow.

For hourly operating help, much the same situation looms. There will be some lay-offs, to be sure, but these will be scattered, confined chiefly to a few regions. Other industries, particularly automobiles and steel, will probably be affected a lot more than the CPI. But there won't be any mass unemployment or movement of employees. Even the more confirmed pessimists don't expect business to be that bad next year.

Management in the process industries will find its own standards of performance tightening, as—on the one hand—stockholders pressure for continued good dividends, and—on the other—costs of operations continue to rise.

Labor-Management Relations

At the bargaining table, labor and management will both be tougher next year. No union is likely to slacken demands for increased wages. Both major chemical unions are recommending that their locals generally seek substantial increases in the coming year. Chances are, however, that the hikes to be sought won't be as large as in the past.

Although there have been an increasing number of two- and three-year wage agreements in the chemical field in recent years, most contracts have been of one-year duration; these will be up for renegotiation in '58. Unions will again be arguing that pay increases are needed to maintain purchasing power in the face of inflationary trends.

Management men will be watching next spring's skirmish between the "Big Three" auto companies and Walter Reuther's United Auto Workers (AFL-CIO). Reuther has set the stage by challenging management to cut prices on '58 models—a suggestion that the auto makers have denounced as unworkable. Reuther may feel that he now has public support for a wage increase. His position: if management won't stop raising prices, then labor must have more money to keep up with the rising cost of living.

The petroleum and paper industries will see a repeat of '57's wage struggles. But cement workers—who were out on strike last spring—may try to avoid another costly walkout in the new year.

Job security will be another point unions will press. Labor will seek an extension of many types of fringe benefits. There will be a revival of interest in variants of supplementary unemployment benefits and a spread-

ing of company-wide bargaining on pension plans, insurance, and other general items.

There may be some easing in the push for multi-plant wage discussions, if regional business softening stirs the self-preservation instinct of local unions. General business conditions will determine the extent of labor's organizational efforts on an industry-wide scale in '58—but these efforts won't abate.

The South, where nearly 40% of the country's chemical industry is now located, will continue to be a lush lure for union organizers. Only about one-half of the U.S.'s eligible chemical workers are under AFL-CIO jurisdiction, and the proportion is considerably smaller below the Mason-Dixon line. AFL-CIO recruiting efforts will increase here.

Trade—Here and Abroad

U.S. chemical marketers will face a rougher battle for overseas outlets—but direct foreign investments will be welcomed by many underdeveloped countries. Total of such process company investments should rise well above the present $1 billion, nudged along by the U.S. government's investment guarantee program.

As the European Economic Community (common market) begins to function, U.S. exports to that area will be squeezed. But American companies will meet the threat by stepping up plans to establish branch operations in the common market area.

In Washington, protectionist forces will seek amendment of the Reciprocal Trade Agreements Act of 1934 (expires June 30, '58). Aim: to strip the President of authority to accept or reject Tariff Commission recommendations under the act's "escape clause" procedures. The Administration will strive to have the act extended for five years.

Look also for a resumption of the Administration's three-year campaign to gain Senate approval for U.S. membership in the Organization for Trade Cooperation (administrative and policing body for the 37-nation group's General Agreement on Tariffs and Trade).

The CPI won't lose the urge to merge next year, as larger companies (over $100 million/year sales) seek acquisitions that will help hold down costs of doing business. And slated to come up before Congress again: premerger notification—requirement that firms give the government 90-day notice before consummating a merger.

Expect, too, a push for some small-business legislation (particulary tax relief), and for laws to correct abuses revealed by the McClellan Committee investigations into labor and management practices.

Transportation, Sales

Freight rates are going up again—and chemicals will be particularly hard hit. Railroads are asking (and will get probably early in the year) a 3% hike for chemical transportation. But there's a different wrinkle in the new request. Railroads want specific rates on specific commodities instead of a flat, across-the-board increase. Freight on coal is expected to go up 10¢/ton; on petroleum, 1¢/100 lbs. Both are important energy and raw material sources for the chemical industry.

The rate jump will apply to most bulk chemicals (e.g., caustic soda, salt, soda ash, ore raw materials), rail-bound items that can't be easily shifted to barging or trucking. But truckers may also ask for boosts.

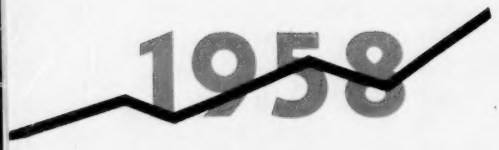
Likely result of the '58 transportation pressures: chemical companies will chuck traditional reluctance to enter the transporting business. Look for expansion in private trucking operations; "special" arrangements with all types of carriers not regulated by ICC; more emphasis on consolidation of shipments; and an intensive assault on a perennial problem—how to beat "dead hauling" (trucks returning empty).

Water transportation of chemicals will get a bigger play in '58. Coastal lines plan to step up sailings, add more ships. And don't be surprised if trailers-on-barges—an adjunct to shipping trailers via flatcars and ships—start plying inland waterway systems, especially the Mississippi and Ohio.

In short, there'll be furious activity in transportation—and it's all aimed at cutting costs.

For chemical marketers, the upcoming 12-month period will be the most competitive since pre-World War II days. There will be more than enough of all

Automation has progressed; more must be done.



chemicals to satisfy all requirements. It's the result of booming capacity expansions that will continue to outrace production until demand catches up.

And that demand will be cultivated, coddled, and pampered by chemical sellers vying for the consumer's dollar. Look for more catering to customers' packaging specifications; increased attention to materials-handling studies; more concentrated coverage by hustling sales departments.

Oversupply will lead to some production cutbacks in scattered areas—perhaps more so than was noted in '57. But you won't hear much wailing by producers. Most are convinced that if capacity in place now won't be utilized in '58, it will be needed within a few years. That goes for polyethylene, ammonia, most heavy acids, chlorine and other amply available products.

Specialties Optimism

How will specialty chemicals fare next year? Generally, observers expect another good year, but most predictions carry threads of concern. Sales—especially of consumer-type products—could be adversely affected by several factors; pace of housing starts, for instance though still high, has slowed. With fewer new homes being built, the market for paints, floor finishes, polishes, dishwasher detergents, will dilate more slowly. Lagging auto sales could also cut into earnings of makers of paints, coatings, and polishes.

Sales of all soap products are in for a decline in '58—some estimates peg the slip at about 3%. Concomitantly, there's anticipation that nonionic detergents use will widen. A boost for liquid laundry detergents should come with introduction next year of the automatic injector devices on newer automatic dishwashers.

Sales of toiletry goods and cosmetics may top the $2-billion figure in '58. Look for a change in promotion of such products, however—makers will emphasize the medical angle to convince the penny-conscious housewife that she's not spending for luxury. At least one cosmetics house may market a tranquilizer.

During the new year an acceleration of the trend toward "self-service" marketing of specialty items will bring a noticeable change in at least three areas—packaging, container sizes, and advertising. Self-selling will become more apparent in drugs and cosmetics, and the trend will spread to other specialty fields, such as hardware, pet supplies, automotive specialties.

The drug industry should do well in '58, but not as spectacularly as in the past two years. There are no such potent prods on the horizon as the Salk vaccine, tranquilizers, Asian flu vaccine. Government scrutiny of drug prices during the year will likely inhibit some companies' merchandising plans.

Smaller manufacturers will garner more attention from union organizers in '58. Figured on the present rate of unionization, one out of 10 now-nonunionized specialty makers will have a union by the end of '58.

Technology

The CPI next year will spend a record $1 billion for research, and, as mentioned before, $550 million of this will be in chemicals and allied products. Even these hefty estimates, however, may prove conservative. Missiles research (including fuels and construction materials) spurred by the Sputnik successes, will likely be intensified, dilate the total research expenditure figures.

It's easier to discern trends rather than specific objectives in CPI research. Among them: more support by industry and government for basic research programs; increasing research costs and decreasing funds from individual private sources (endowments, philanthropy); an easing in '58 of the research manpower problem—as a result of mechanical aids (data recorders, etc.), better utilization of scientists, and an increase in semiprofessional help.

Automatic instruments will head the list of chemical engineering aids that will be used more widely in '58. Several instrument manufacturers have stepped up efforts to endow laboratory-type measuring devices with enough reliability to stand up under continuous process use.

Look for new engineering applications for small "desk-side" computers; process investigation via simulation on new, special-purpose analog computers.

There's little indication that chemical companies will soon tackle commercial reprocessing of irradiated fuel (nuclear scrap recovery), but a start on "cold" scrap recovery will be made in '58. At least one firm has a pilot-scale process for handling unirradiated uranium; others will probably undertake similar projects as new reactor start-ups swell the demand for atomic fuel elements.

The government's rockets and missiles program present many challenging opportunities for the CPI's engineering and production ingenuity—particularly in the development of methods for producing and handling high-energy fuels and propellents. Indication of the widening horizon: fuel producers have already committed more than $90 million for boron-fuel plants, and construction will start next year.

Thus it becomes apparent that in all fields 1958 will be a year of high activity. And through all operations will run a knuckle-hard, economy awareness that could make '58 one of the best years the industry has known.

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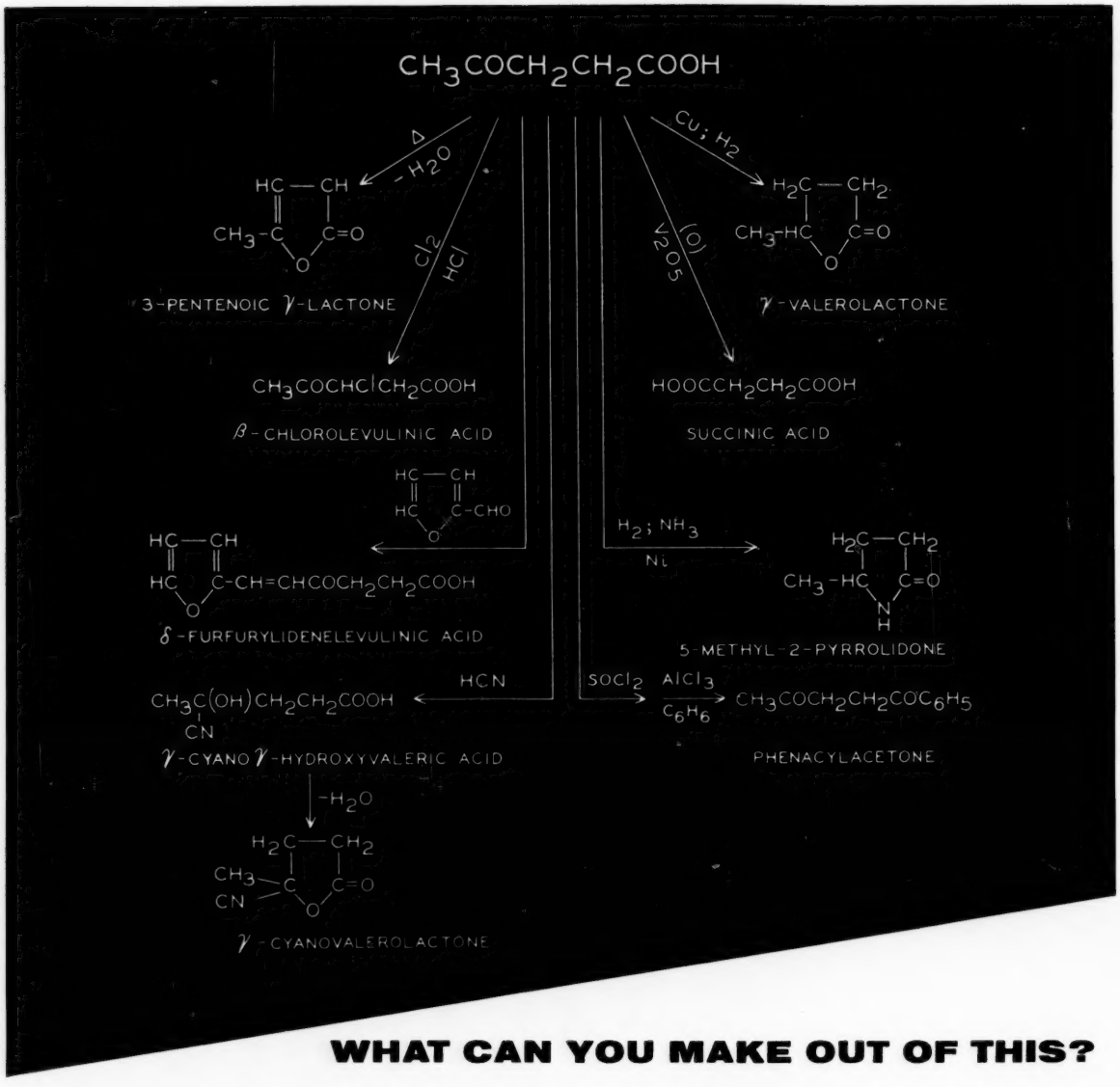
SOME REACTIONS OF **QO LEVULINIC ACID**



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Commodity Forecast

CHEMICAL WEEK
December 28, 1957

Will "qualified optimism" about '58 mean price boosts? Some chemical marketers will post "necessary" price hikes during the first quarter of '58. But there's evidence, too, that general price increasing will be more restrained than it has been in a long time. One indication: the sit-tight policy of producers of large-volume basic chemicals. Here's how 11th-hour reports from marketers of selected basic chemicals substantiate the outlook of "qualified status quo" (*see also p. 74*).

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Alcohol supplies below normal; no price hikes anticipated. Ethyl alcohol supplies have undergone a steady "statistical tightening" in '57, have dwindled to about a month's supply. But there's disagreement among the experts about supply trends in the weeks ahead. Some alcohol marketers say a reversal of the squeeze trend is already in progress and stocks will soon reach "comfortable" in-balance proportions. Others foresee a further tightening of supplies before a swing toward a balanced supply/demand status is regained.

January price increases anticipated nervously by some consumers (*CW Market Newsletter, Dec. 7*) didn't materialize. No general alcohol price boost is likely before the third quarter of '58. But there's a toe-in-the-door qualification that "a possible adjustment of drum and tank price differentials may come in the second quarter."

•

Aromatic solvents are more than plentiful, in contrast with tight alcohol supplies. Benzene is in "tremendous surplus," despite curtailed production. Some producers of petroleum-derived benzene have slowed output, and there's a presumed decrease in output of coke-oven material because of cutbacks in steel production.

Will the surplus drive prices down? Some benzene makers vehemently label reports of such a move (*CW Market Newsletter, Oct. 26*) as "utter folly." Their reason: price cutting is obviously not a sane solution for the benzene surplus problem.

Toluene, too, is reportedly in "considerable excess." Xylene supplies, on the other hand, are under far better control. Although two or three producers could supply all U.S. xylene needs, no individual producer seems tempted to "bust the market." All are content to take a share and help maintain a stable situation.

•

Sulfur is sensitive to the nation's over-all business conditions, accurately reflecting the prevalent '58 business forecast. The expected slackening of sulfur demand in early '58 is tied to expected "lower than normal" output of steel and paper.

Sidling softly around the price situation, U.S. sulfur producers exhibit a noticeable sensitivity about Mexican competition. Two terse com-

Commodity Forecast

(Continued)

ments sum up their attitude about possible sulfur price trends: "We hope, but can't guarantee, that prices will remain stable" and "up or down, we will meet the competition."

•

There's a strengthening demand for sulfuric acid. Virtually all sulfuric acid producers have felt the jolt of a badly slumping demand for the acid—due primarily to cutbacks in steel and rayon manufacture. One bright spot for the first quarter of '58 is the startup of the busy fertilizer season, which will significantly boost sulfuric demand. Steel requirements, too, are expected to pick up somewhat after the holiday season.

Increased sulfur prices, if they come, will almost certainly trigger the long-awaited hike of acid costs. For sulfuric acid makers, depressed sulfur prices in '57 was a "temporary breather."

•

Predictions concerning U. S. glycerine outlook are many. Through the welter, however, run some concordant threads: no imminent change expected in the current market softness; no anticipated price increases; a continuing climb foreseen.

Swelling national glycerine stocks (now approaching the 75-million-lbs. mark) have convinced some observers that a drastic price-slashing is a '58 probability. But that's not likely. A 75-million-lbs. inventory nowadays isn't causing producers as much worry as a 60-million-lbs. pile did a few years ago. Changes in distribution patterns, including the building of necessarily well-stocked—and convenient—shipping points throughout the country, account for much of today's higher stock position.

A better criterion of glycerine's market status, say producers, is rate of consumption—and that's above last year's. Nonetheless, look for a further easing in total glycerine production as output of natural material declines along with slipping soap production and sales.

Thus, increasing consumption, decreasing production tend to preclude any substantial glycerine price drop. Some factors though (e.g., influx of foreign crude) may bring about a modest reduction, and this could happen about midyear.

•

What will the chemical price index look like a year from now? It's been steadily inching upward since Jan. '57 (*see Business Indicators, p. 32*), and chances are that a similar pattern, although with a somewhat less apparent incline, will emerge over the next 12 months.

CW's output index, which has undergone some definite dips and climbs, will probably continue the present late-quarter decline, at least though the early months of the new year. Anticipated pickup in business activity later on, though, should prod '58 production close to, or at the most, slightly below, the average of '57.

We pump gas back into the ground—to assure you a constant supply of GULF ETHYLENE!

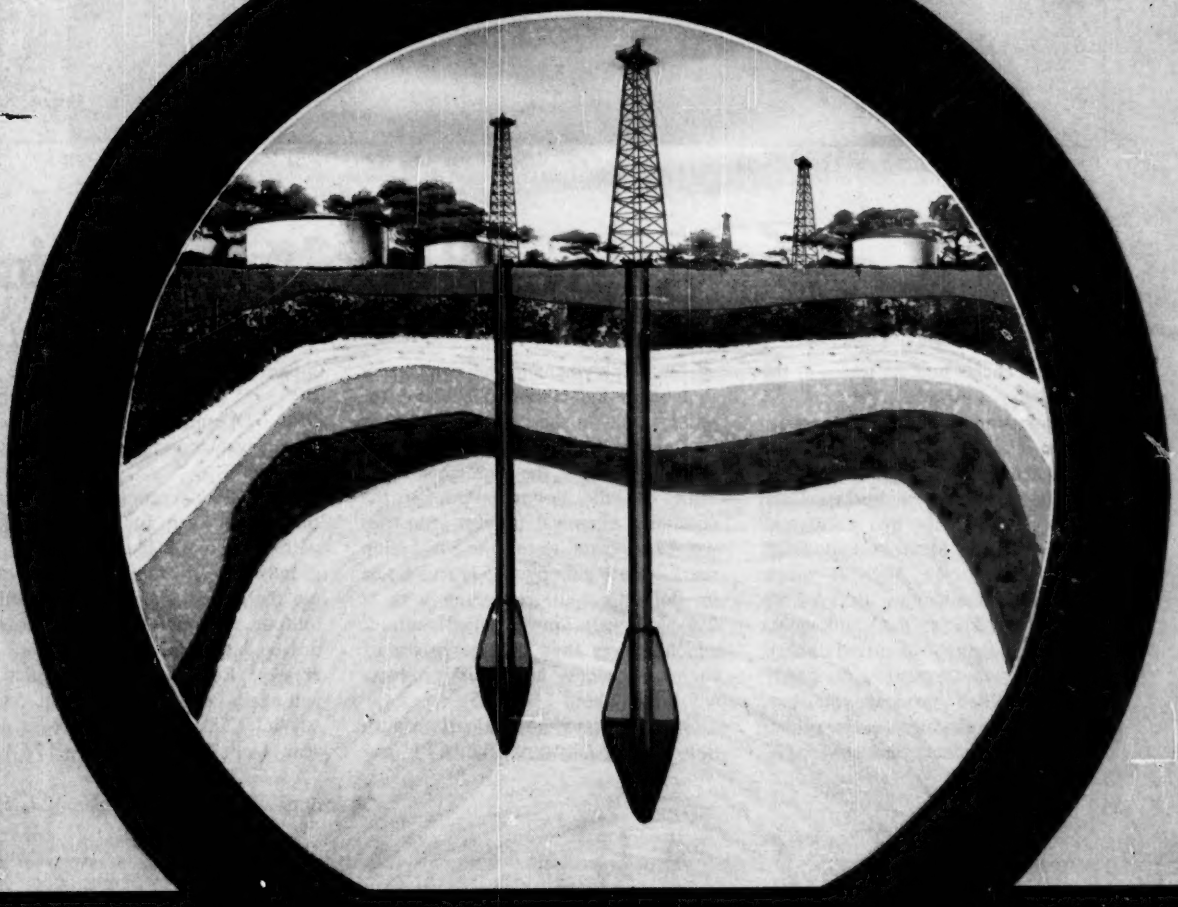
Now it's dome-plugging . . . Gulf ingenuity driving the drill bit deep into a giant, upthrusting salt dome beneath Fannett Field, in Texas . . . to "hang" mammoth salt dome cavities 3,000 feet underground! These novel underground storage facilities hold more than a month's production of ethylene, a stockpiled reserve maintained by Gulf to protect your supply continuity. **Above the ground,** Gulf's two ethylene plants at nearby Port Arthur produce more than 1,000,000 pounds a day. Together, these facilities make Gulf your most dependable source of supply for quality ethylene. And Gulf can deliver ethylene to almost any point on the Gulf coast through its own pipeline system. **Let us tell you the whole story on Gulf Ethylene.**

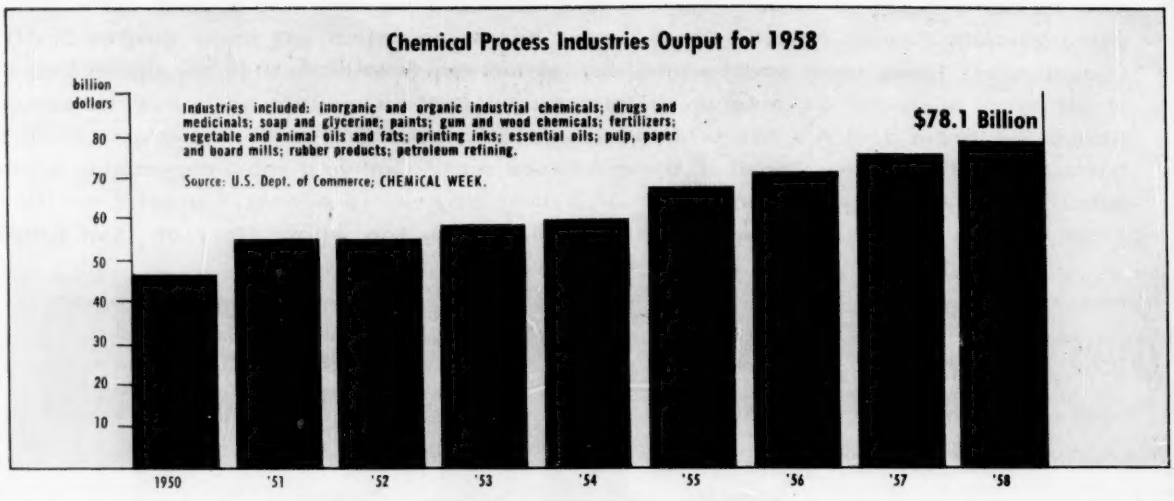
GULF

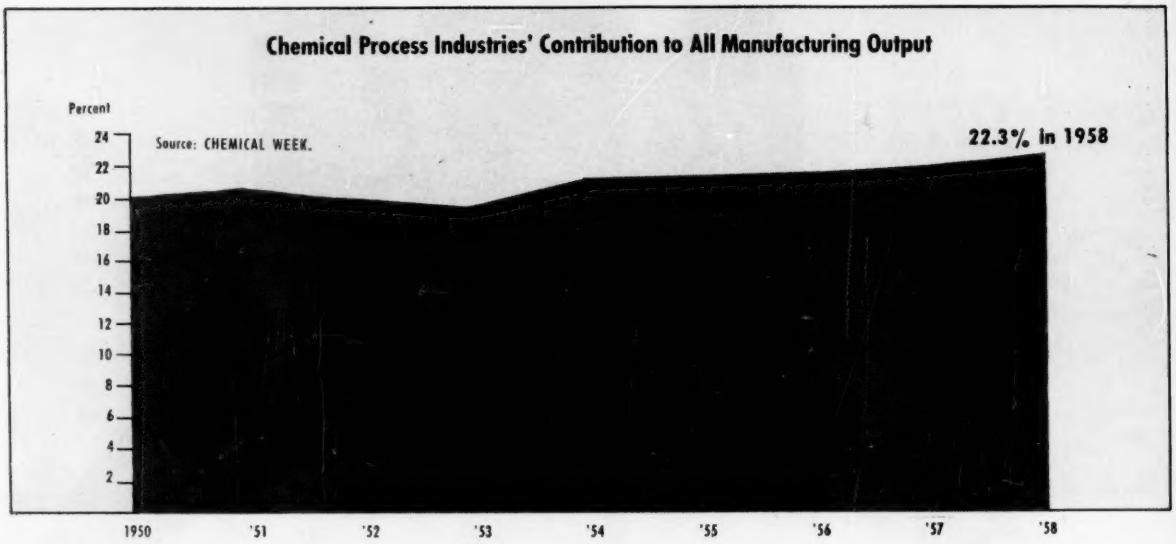
PETROCHEMICALS DEPARTMENT

GULF OIL CORPORATION • PITTSBURGH 30, PENNSYLVANIA

Quality Chemicals from Petroleum







1958 Benchmarks for

The 17 charts and 23 tables in this seven-page statistical report give CPI management the benchmarks for decision-making in 1958. Data is derived from several sources—government agencies, private business, and surveys conducted by CHEMICAL WEEK and the McGraw-Hill Dept. of Economics.

In '57, the companies surveyed accounted for 82% of the employment in the petroleum refining industry, 73% of the employment in the chemicals and allied products industry, 63% of the employment in the rubber and rubber products industry, 31% of the employment in the pulp, paper and board industry, and 30% of the employment in the ceramics industry.

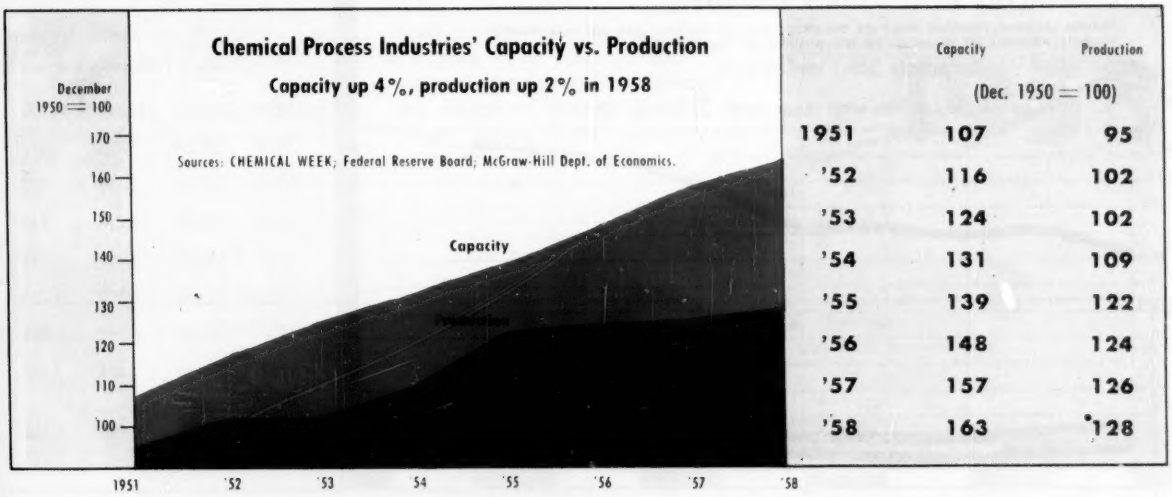
The data reveals some important trends. Here are the highlights:

In '58, the dollar output of the combined chemical process industries will be expected to top the $78-billion mark—a 3% gain over '57. This boost in dollar output compares with a 2%-plus gain in physical output, which means that average prices of chemical process industries' products will be up about 1% in '58.

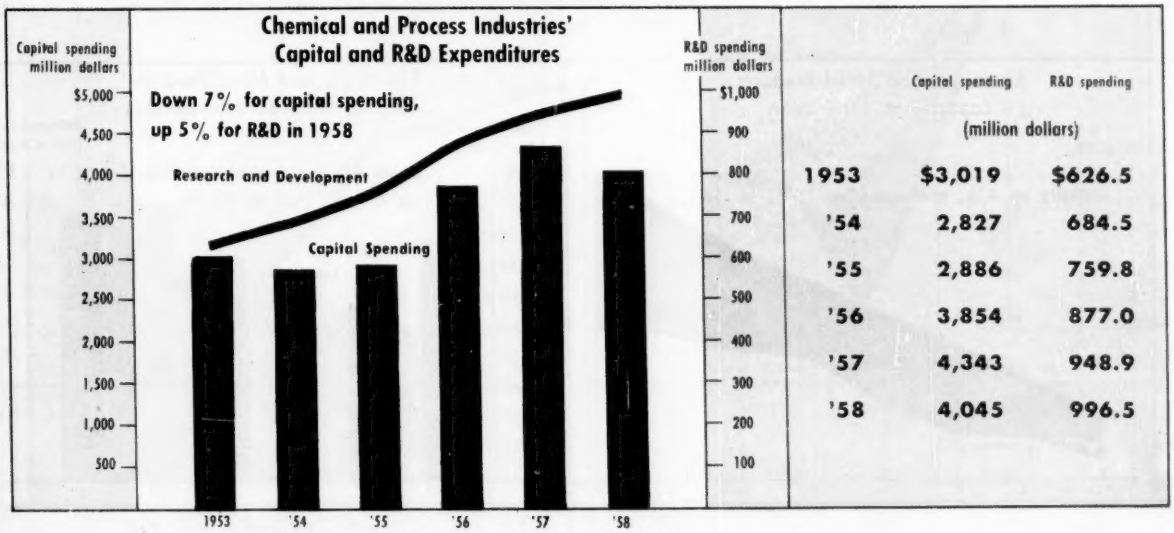
Operating rate—the ratio of production to capacity—of the CPI has tapered off from 90% (at the end of 1955) to its present level of under 85%. Operating rate for all manufacturing industries now stands at about 80%.

With CPI operating rates lower than they have been for some time and with labor costs likely to rise in the months ahead, the profit outlook is not the rosiest. Increased productivity (output per man-hour) will probably not be high enough to offset cost increases. Result: slim profit margins will again be a big problem in '58.

While '58 is expected to be a good year (*see Forecast '58, p. 75*) the



	Capacity	Production
	(Dec. 1950 = 100)	
1951	107	95
'52	116	102
'53	124	102
'54	131	109
'55	139	122
'56	148	124
'57	157	126
'58	163	128



	Capital spending	R&D spending
	(million dollars)	
1953	$3,019	$626.5
'54	2,827	684.5
'55	2,886	759.8
'56	3,854	877.0
'57	4,343	948.9
'58	4,045	996.5

Sources: McGraw-Hill Dept. of Economics; National Science Foundation; CHEMICAL WEEK.

Decision-Making in '58

rate of CPI expansion will slacken. That's primarily because demand for chemical process industries' array in '57 fell short of matching increases in capacity that went onstream. And capacity increases planned for '58 will further outstrip the output gains expected. Over-all, estimates for '58 indicate that an additional 4% will be added to CPI capacity: at the same time, output will increase 2%.

Since the end of the Korean War, the CPI has steadily piled on capacity at an average rate of 7%/year. During the same period, physical production of the CPI rose only 3%/year, on an average. Result: installed capacity is well ahead of actual production needs—at least temporarily.

Only in mid-'57 did the expansive new capacity begin to make its effect felt. Many cutbacks in capital spending—equivalent to a drop of 7% in planned capital expenditures for '58—have been made since.

Despite the rapid buildup of capacity, chemical process companies still figure on spending more than $4 billion on new plants and equipment in '58. And by any measure, that's a whopping high level of capital investment. What's more, CPI management can find cheer in the historical lesson that overcapacity in the CPI is cyclical and temporary. Steadily increasing levels of production, spurred by research and new-product development, eventually crowd capacity, force it to still-higher levels.

Research and development expenditures will hit new highs next year. Brand-new products and technologies will push '58 R&D spending close to the $1-billion mark, an increase of 5% over '57, a gain of 60% over '53.

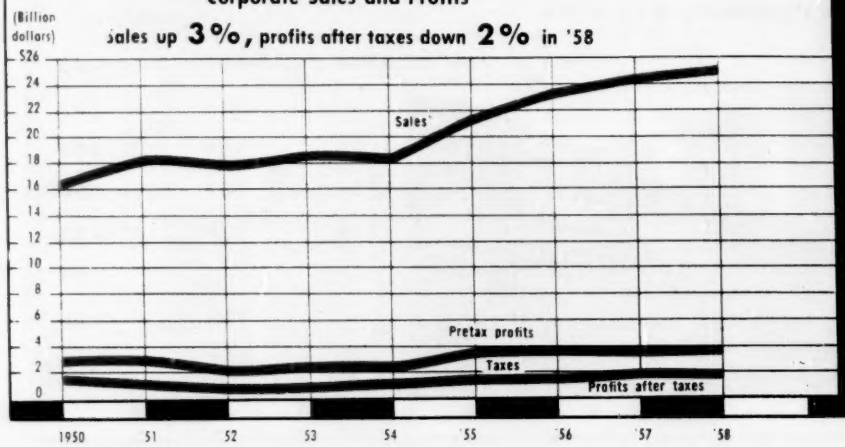
So much for the broad CPI trend. For a close-up of selected industries, see pages 86-90.

Chemicals and Allied Products

(Includes industrial chemicals; drugs and medicinals; soap and glycerine; gum and wood chemicals; fertilizers; vegetable and animal oils and fats; printing inks; essential oils.)

Corporate Sales and Profits

Sales up 3%, profits after taxes down 2% in '58

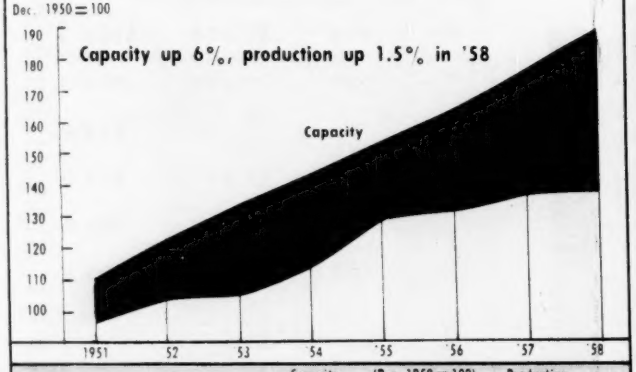


	Sales (billion dollars)	Pretax profits	Profits after taxes
1950	$16,104	$2,625	$1,323
1951	18,055	2,823	1,077
1952	17,724	2,156	832
1953	18,440	2,223	864
1954	18,696	2,156	998
1955	21,405	3,360	1,770
1956	23,610	3,540	1,885
1957 prelim.	24,485	3,625	1,940
1958 est.	25,100	3,600	1,900

Sources: U.S. Dept. of Commerce; CHEMICAL WEEK.

Chemicals and Allied Products
Capacity vs. Production

Capacity up 6%, production up 1.5% in '58

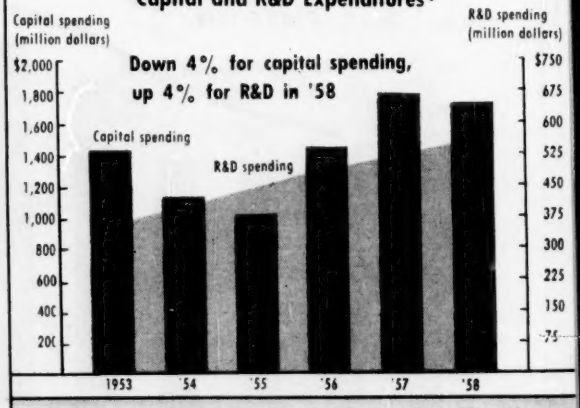


	Capacity (Dec. 1950 = 100)	Production
1951	110	99
1952	122	105
1953	134	107
1954	142	115
1955	152	130
1956	163	133
1957	176	138
1958	187	140

Sources: Federal Reserve Board; McGraw-Hill Dept. of Economics; CHEMICAL WEEK.

Chemicals and Allied Products
Capital and R&D Expenditures

Down 4% for capital spending, up 4% for R&D in '58



	Capital spending (million dollars)	R&D spending
1953	$1,428	$361.1
1954	1,130	395.0
1955	1,016	440.5
1956	1,455	497.8
1957	1,795	527.7
1958	1,723	550.0

Sources: McGraw-Hill Dept. of Economics; National Science Foundation; CHEMICAL WEEK.

How Will You Fare in '58?: Forecast for 10 Key Industries

On this and the following four pages are charts and tables that sum up capacity, production, capital spending and R&D expenditures of 10 key sectors of the CPI—chemicals and allied products; industrial chemicals; drugs and medicinals; fertilizers and minerals; soaps and detergents; synthetic fibers; petroleum refining; rubber and rubber products; pulp, paper and paperboard; and ceramics.

Sales of chemicals and allied products are expected to top $25 billion in '58, an all-time high—3% ahead of '57 sales. Higher operating costs, however, will eat into profits so that little, if any, net gain can be expected. If pretax and after-tax profits should dip, it will be only fractionally.

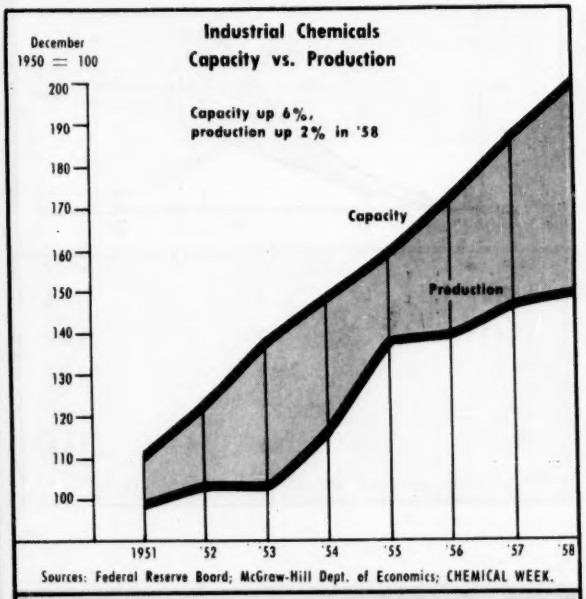
The industry expects to spend 4% less for new plants and equipment than it did in '57. Despite this drop, anticipated capital outlay of more than $1.7 billion in '58 will be the second highest in the industries' history (capital investment in '57 was $1.8 billion).

Chemicals producers are expected to increase research and development expenditures by about 4% in '58;

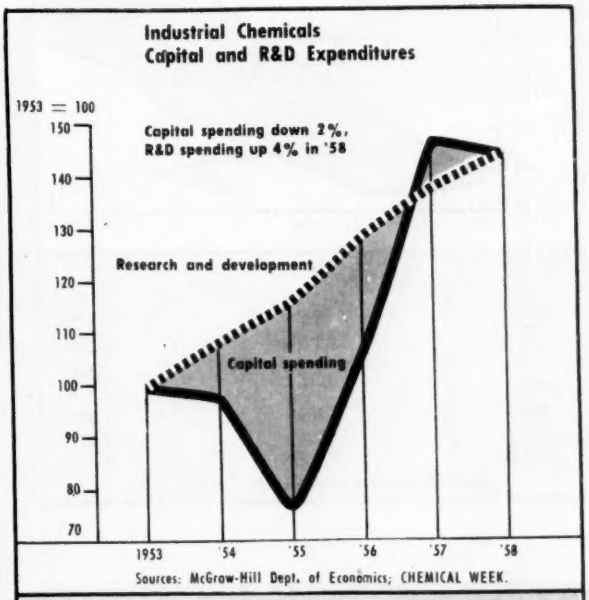
R&D dollar outlays should reach $550 million in '58—a 50% increment in just five years.

Over-all, chemicals-and-allied-products companies are now operating at roughly 80% of capacity—a cutback from the 90% level registered in '55. Temporarily, at least, chemical management can expect little change in this situation. Reason: planned increases in capacity for '58 will outstrip expected production gains.

1958



	Capacity	Production
	(December 1950 = 100)	
1951	111	98
1952	123	103
1953	138	103
1954	149	116
1955	159	138
1956	172	139
1957	187	146
1958	198	149



	Capital spending	R&D spending
	(1953 = 100)	
1953	100	100
1954	97	108
1955	75	116
1956	107	129
1957	146	138
1958	143	144

Industrial chemical operating rates stand a little below the 80% mark today. Companies producing industrial organic and inorganic chemicals (an $8-billion/year business) will have doubled their production capacity by the end of '58 (taking 1950 as a base year). The '58 capacity total will be 6% higher than that of '57.

Capital spending by chemical concerns dropped in '54 and '55, but rose again in '56—investment in new plants and facilities was hiked about 43% in that year alone. Another staggering increase of 36% was added in '57. Next year's outlays for capital equipment will be trimmed—but only by 2%.

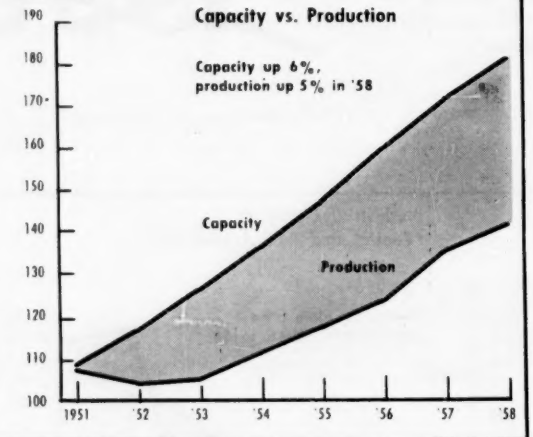
The ease-up in capital spending will benefit research. Plans are to increase R&D spending an average of 4% in '58. This follows on the heels of a 7% boost made in R&D spending in '57.

While the outlook for the various sectors of the process industries is broadly similar—capital expenditures down in '58, R&D expenditures up—the drugs and petroleum refining industries buck a part of this trend.

As a group, ethical and proprietary drug firms in '58 will match the capital spending increment of 12% made in '57. Petroleum refiners figure on spending $933 million on new plant and equipment in the next 12 months, 5% more than in '57.

Drugs and Medicinals

Capacity vs. Production

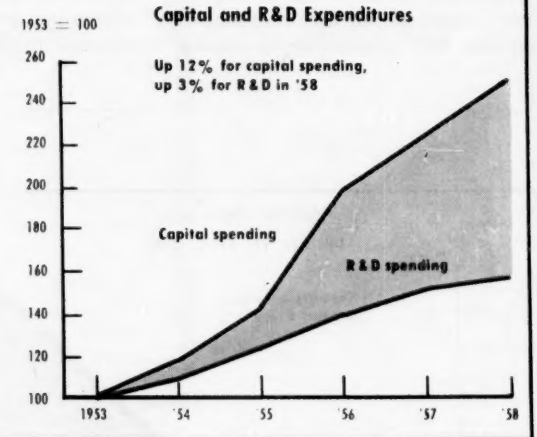


(December 1950 = 100)	Capacity	Production
1951	108	107
1952	117	103
1953	126	104
1954	136	111
1955	147	117
1956	159	123
1957	171	134
1958	181	141

Sources: McGraw-Hill Dept. of Economics; CHEMICAL WEEK.

Drugs and Medicinals

Capital and R&D Expenditures

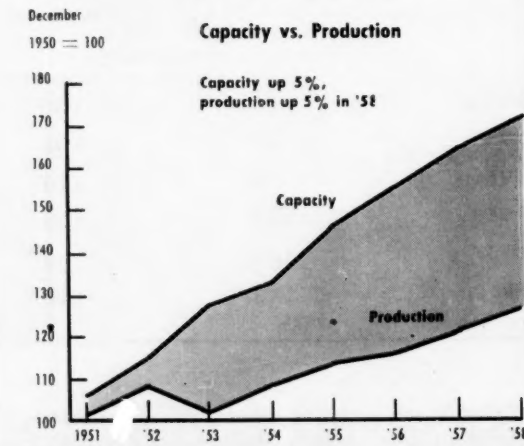


(1953 = 100)	Capital spending	R&D spending
1954	119	110
1955	142	122
1956	198	139
1957	223	151
1958	250	156

Sources: McGraw-Hill Dept. of Economics; CHEMICAL WEEK.

Fertilizers and Minerals

Capacity vs. Production

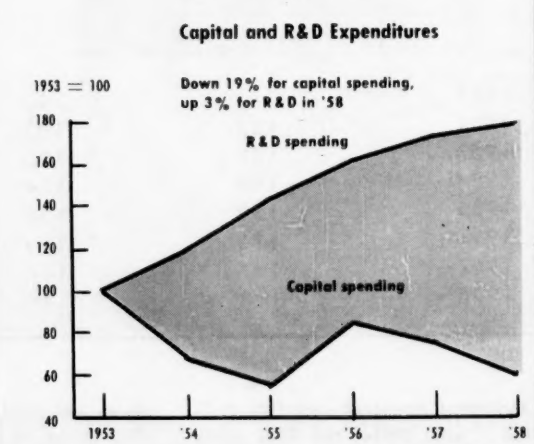


(December 1950 = 100)	Capacity	Production
1951	106	101
1952	114	108
1953	127	102
1954	133	108
1955	146	113
1956	155	115
1957	164	121
1958	172	127

Sources: Federal Reserve Board; McGraw-Hill Dept. of Economics; CHEMICAL WEEK.

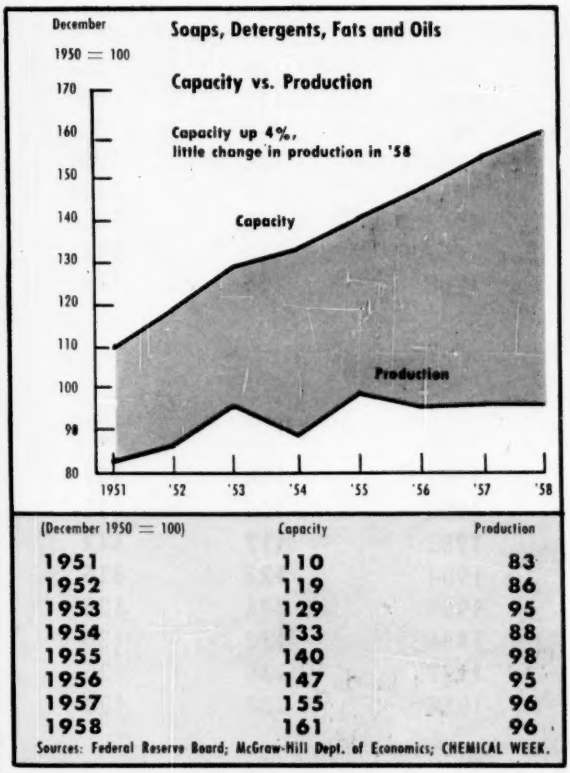
Fertilizers and Minerals

Capital and R&D Expenditures



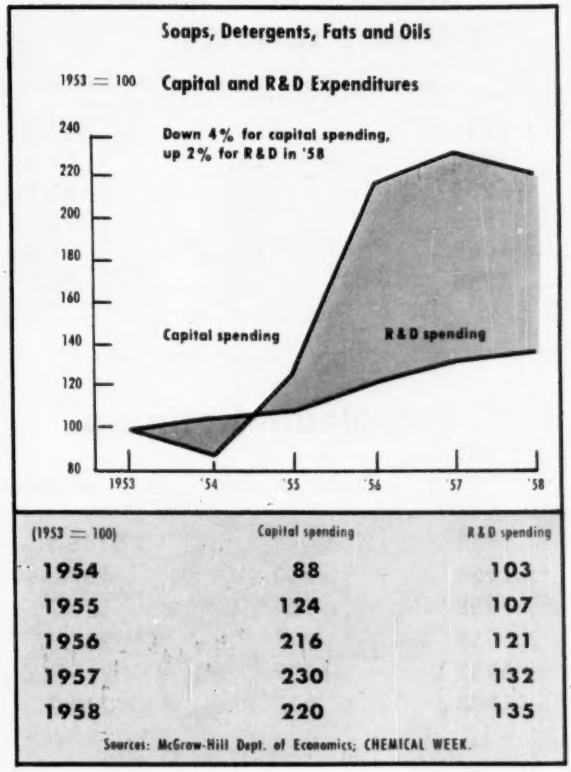
(1953 = 100)	Capital spending	R&D spending
1954	67	120
1955	57	143
1956	83	160
1957	74	173
1958	60	178

Sources: McGraw-Hill Dept. of Economics; CHEMICAL WEEK.



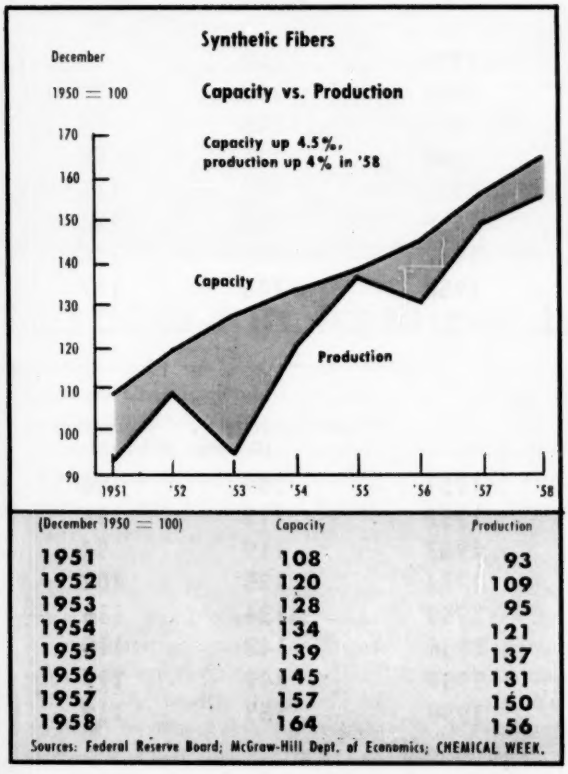
(December 1950 = 100)	Capacity	Production
1951	110	83
1952	119	86
1953	129	95
1954	133	88
1955	140	98
1956	147	95
1957	155	96
1958	161	96

Sources: Federal Reserve Board; McGraw-Hill Dept. of Economics; CHEMICAL WEEK.



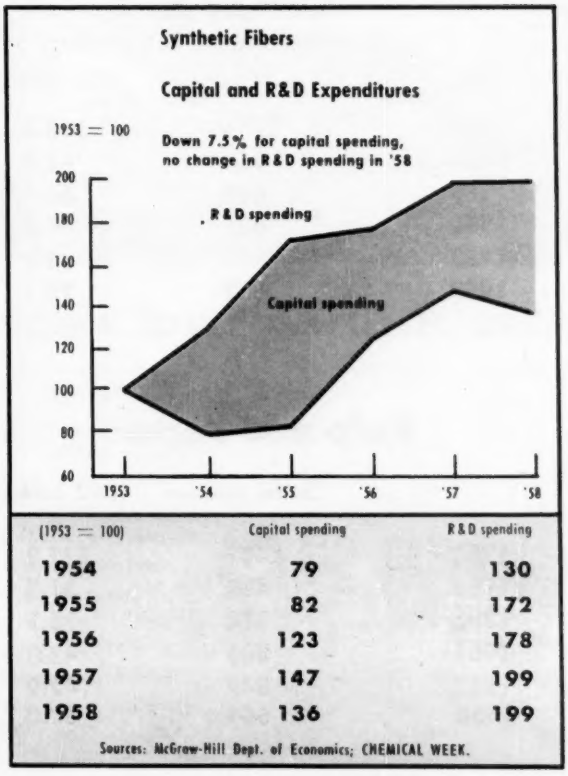
(1953 = 100)	Capital spending	R&D spending
1954	88	103
1955	124	107
1956	216	121
1957	230	132
1958	220	135

Sources: McGraw-Hill Dept. of Economics; CHEMICAL WEEK.



(December 1950 = 100)	Capacity	Production
1951	108	93
1952	120	109
1953	128	95
1954	134	121
1955	139	137
1956	145	131
1957	157	150
1958	164	156

Sources: Federal Reserve Board; McGraw-Hill Dept. of Economics; CHEMICAL WEEK.



(1953 = 100)	Capital spending	R&D spending
1954	79	130
1955	82	172
1956	123	178
1957	147	199
1958	136	199

Sources: McGraw-Hill Dept. of Economics; CHEMICAL WEEK.

Rubber and Rubber Products

	Capital spending (million dollars)	R&D spending (million dollars)
1953	$161	$53.6
1954	131	59.0
1955	150	65.9
1956	201	73.1
1957	208	81.9
1958	193	86.0

	Capacity (December 1950=100)	Production (December 1950=100)
1951	104	86
1952	111	98
1953	118	89
1954	126	102
1955	137	111
1956	145	106
1957	150	112
1958	155	114

Petroleum Refining

	Capital spending (million dollars)	R&D spending (million dollars)
1953	$675	$145.9
1954	750	157.0
1955	704	170.7
1956	711	204.8
1957	889	225.3
1958	933	240.0

	Capacity (December 1950=100)	Production (December 1950=100)
1951	104	107
1952	109	111
1953	117	112
1954	122	115
1955	126	125
1956	132	130
1957	135	125
1958	138	130

Ceramics

(Includes stone, clay and glass products)

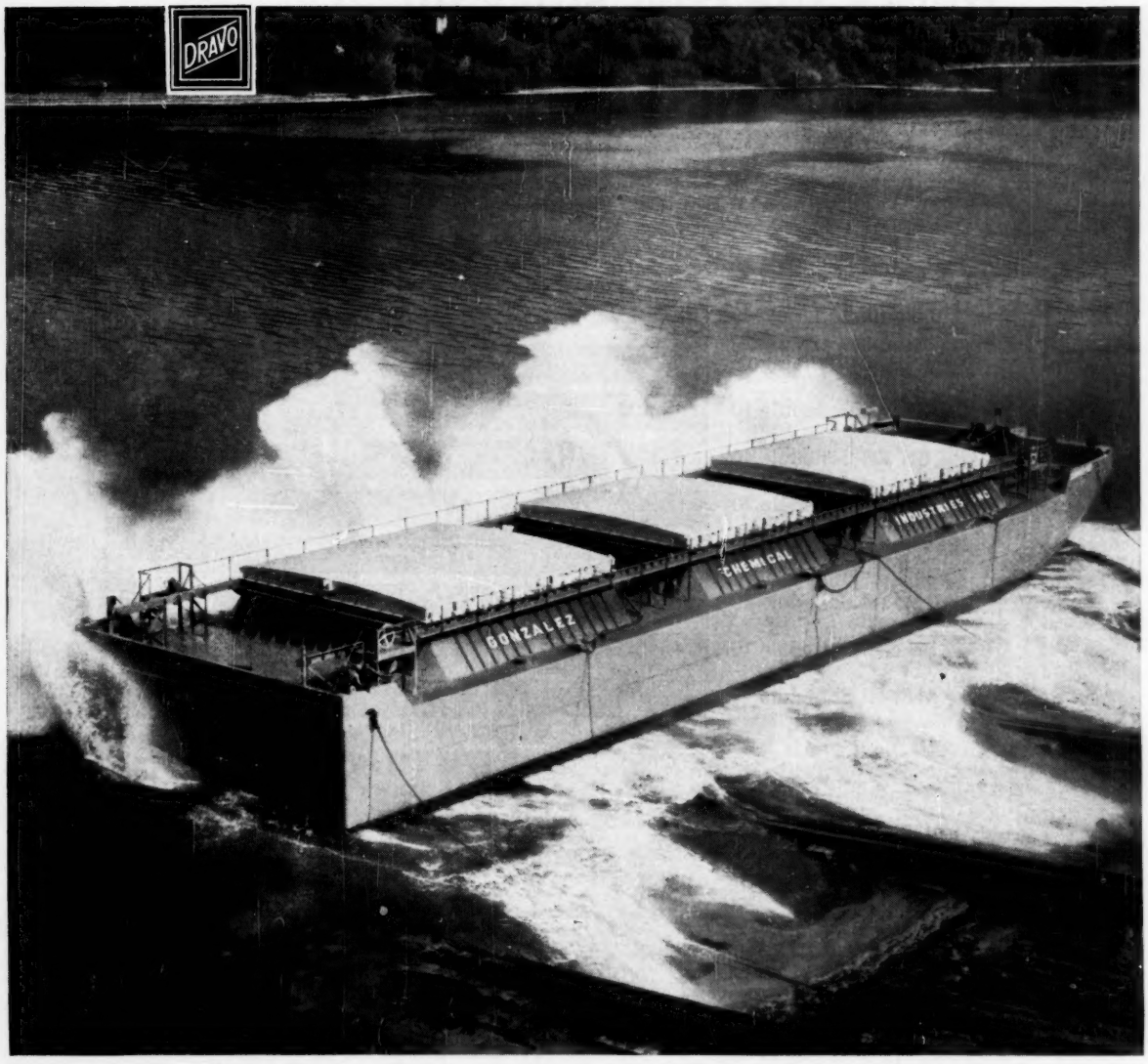
	Capital spending (million dollars)	R&D spending (million dollars)
1953	$346	$38.0
1954	361	42.0
1955	498	46.4
1956	686	58.5
1957	604	66.1
1958	552	70.7

	Capacity (December 1950=100)	Production (December 1950=100)
1951	108	88
1952	113	96
1953	116	94
1954	121	98
1955	127	115
1956	136	116
1957	141	115
1958	145	117

Pulp and Paper

	Capital spending (million dollars)	R&D spending (million dollars)
1953	$409	$27.9
1954	455	31.5
1955	518	36.3
1956	801	42.8
1957	847	47.9
1958	644	50.0

	Capacity (December 1950=100)	Production (December 1950=100)
1951	104	86
1952	112	96
1953	119	94
1954	125	102
1955	134	116
1956	142	115
1957	149	117
1958	153	119



1500-ton fertilizer barges for Puerto Rico

Gonzalez Chemical Industries, Inc., uses two of these 177-foot barges to transport chemical fertilizers between Puerto Rico and neighboring islands. These welded steel barges were designed especially for this job.

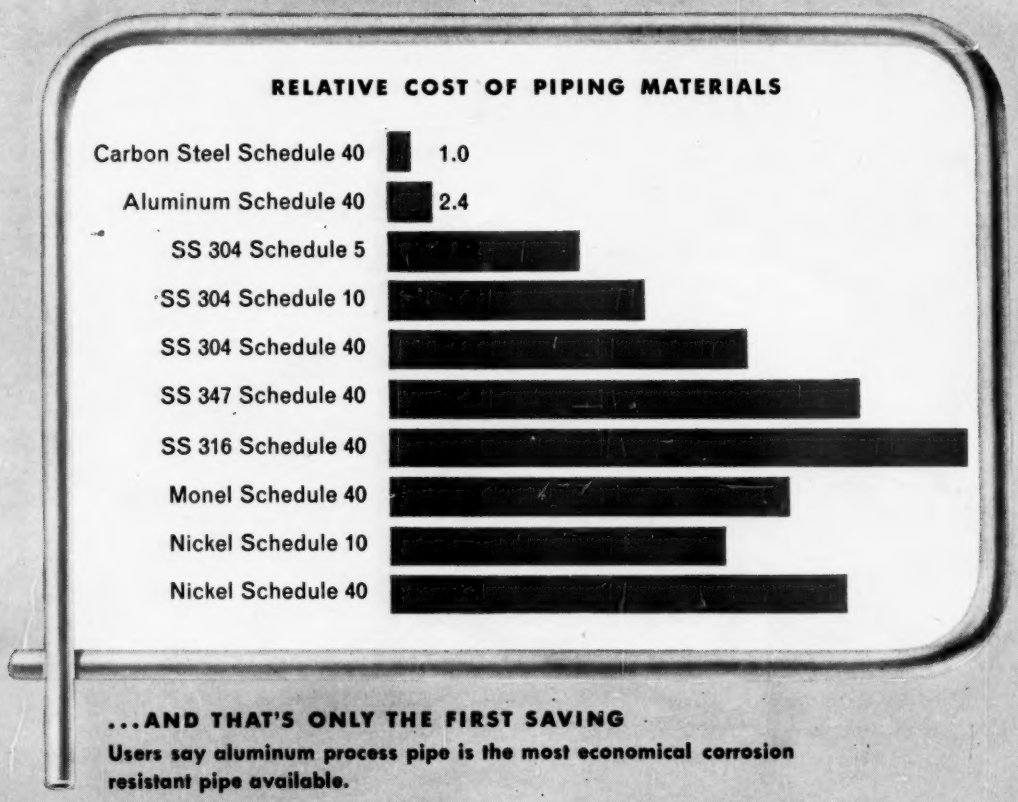
Dravo hatch covers protect cargoes from weather and sea water. These watertight covers, equipped with quick acting clamps and adjustable rollers, readily expose up to 50% of the hatch area for speedy loading and unloading.

Towing characteristics were checked by model basin tests to assure performance. Careful engineering and design know-how gained through building more than 3,700 hulls qualify Dravo as a supplier of marine equipment for both deep water and river operation.

For information or consultation on your particular barge or towboat requirements, telephone SPalding 1-1200, or write to DRAVO CORPORATION, PITTSBURGH 25, PENNSYLVANIA.

DRAVO
CORPORATION

Here's the cost story on Reynolds Aluminum process pipe



...AND THAT'S ONLY THE FIRST SAVING

Users say aluminum process pipe is the most economical corrosion resistant pipe available.

THESE ARE THE REASONS:

- Aluminum costs less to buy.
- Aluminum costs less to install because of light weight and weldability.
- Aluminum resists corrosive effect of hydrogen peroxide, nitrogen solutions, many acids, alcohols, foods, sweet and sour crudes, raw or refined gases, kerosene, gasoline, napthas, and many other process liquids.
- Aluminum is non-sparking for greater safety to plant and personnel.
- Aluminum requires little maintenance—has longer life.

Write for this important literature: "Corrosion Keys for Aluminum" and "Aluminum Process Pipe".

For more information on how you can save with Reynolds Aluminum Process Pipe, call the Reynolds office listed under "Aluminum" in classified telephone directories, or write *Reynolds Metals Company, P.O. Box 1800-CM, Louisville 1, Kentucky. International Division, 19 East 47th Street, New York, 17, N.Y.*

The Finest Products Made with Aluminum are made with REYNOLDS ALUMINUM

Watch Reynolds All-Family Television Program "DISNEYLAND", ABC-TV

Max Factor, Jr., and Davis Factor plan Factor growth program.

Looking Beyond Cosmetics

A new organizational setup is going into effect at Max Factor & Co. (Hollywood, Calif.) this month. By combining its Pharmaceutical and Specialty Division with its Cosmetics Division, Factor hopes to strengthen its competitive position in the turbulent cosmetic industry, continue the steady growth that has put it in the No. 3 spot in the U. S. cosmetics industry.*

The change in organization comes just a year after Factor made another important change, a switch in its pattern of expansion. Until last year, Factor grew strictly by internal expansion; then in '56, recognizing the increased importance of noncosmetic products, the firm made its first expansion via the acquisition route, purchased Lee, Ltd.

Products added through the purchase of Lee, which specialized in hair products, include Sof-Set, an aerosol spray for holding hair in place, and Dri-Mist, an aerosol spray deodorant. At the same time that it was building its product line with purchased items, however, Factor continued to expand by adding its own developments—Sebb, a pharmaceutical product for dandruff control, and Curl Control.

Factor's expanding interest in pharmaceuticals and noncosmetic specialties is quickly paying off in increased sales. Sales jumped from $15 million in '52 to $32,613,771 in '56, and shot up to $33,496,000 for the first nine months of '57. And by year's end, the firm expects sales to total nearly $45 million.

Although Factor expects to increase its interest in pharmaceuticals and noncosmetic specialties, it's not neglecting the cosmetics end of the business, which still accounts for the bulk of company sales.

With Growth, Stability: Factor attributes part of its steady growth and stability to its long record of strong family management. Two sons of Max, Sr. (who died in 1938), head the company: Davis, chairman of the board, handles the financial and administrative end; Max, Jr., president, in charge of research, is responsible for creating new and improving present products. Also active in top management are two other sons, a son-in-law and three grandsons.

One of the grandsons, Alfred Firestein, has been named as the new director of marketing in the U. S., and Chester Firestein, another grandson, is director of merchandising in the U. S. Both positions were created through the company's new organizational plan. Seldom does the firm go outside to seek top management talent.

Another reason for the firm's stability is its interest in long- rather than short-range results, its eschewal of fads. Explains Davis Factor, "It costs as much to promote a fad as it does a staple. If the fad fades early, you end up losing money. We prefer to bet on products that have long-range potential. And we haven't made very many mistakes, so far."

However, Davis wryly admits Factor did make one error—the decision, a few years ago, not to go into the manufacture of home permanents. Although the home permanent market has proved itself anything but a fad, Factor has no plans to enter it at this late date.

Crystal-Balling: Factor believes that in the future, "treatment" items (as opposed to glamor and beauty products) will be the area in which the company's greatest expansion will take place.

Some of the fields in which it expects to concentrate its research:

- Hygienic and skin care products

*In the cosmetics field, Max Factor ranks third, after Avon and Revlon, or fourth, if Helene Curtis, which, in addition to manufacturing cosmetics, makes beauty parlor equipment, is considered.

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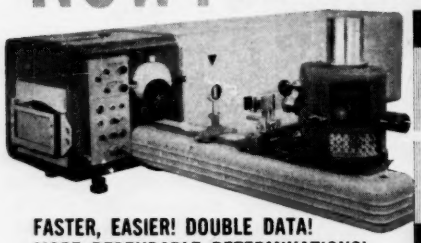

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SPECIALTIES

—for example, those to relieve acne and dandruff.

- Additional use of hormones in certain cosmetics.
- Methods to retard the aging process. (Factor believes that an internal preparation may be the answer to this riddle.)

Actually, Factor can be considered a pioneer in cosmetics research. In 1932, Factor formed one of the first research departments in the cosmetics field, has continued this policy over the last 25 years. Initially, interest in research was prompted by the motion picture industry. Object of this early research was to find makeup that would look well on movie personalities during their stint in front of cameras. Research on cosmetics, suitable for the television screen is a current continuing activity.

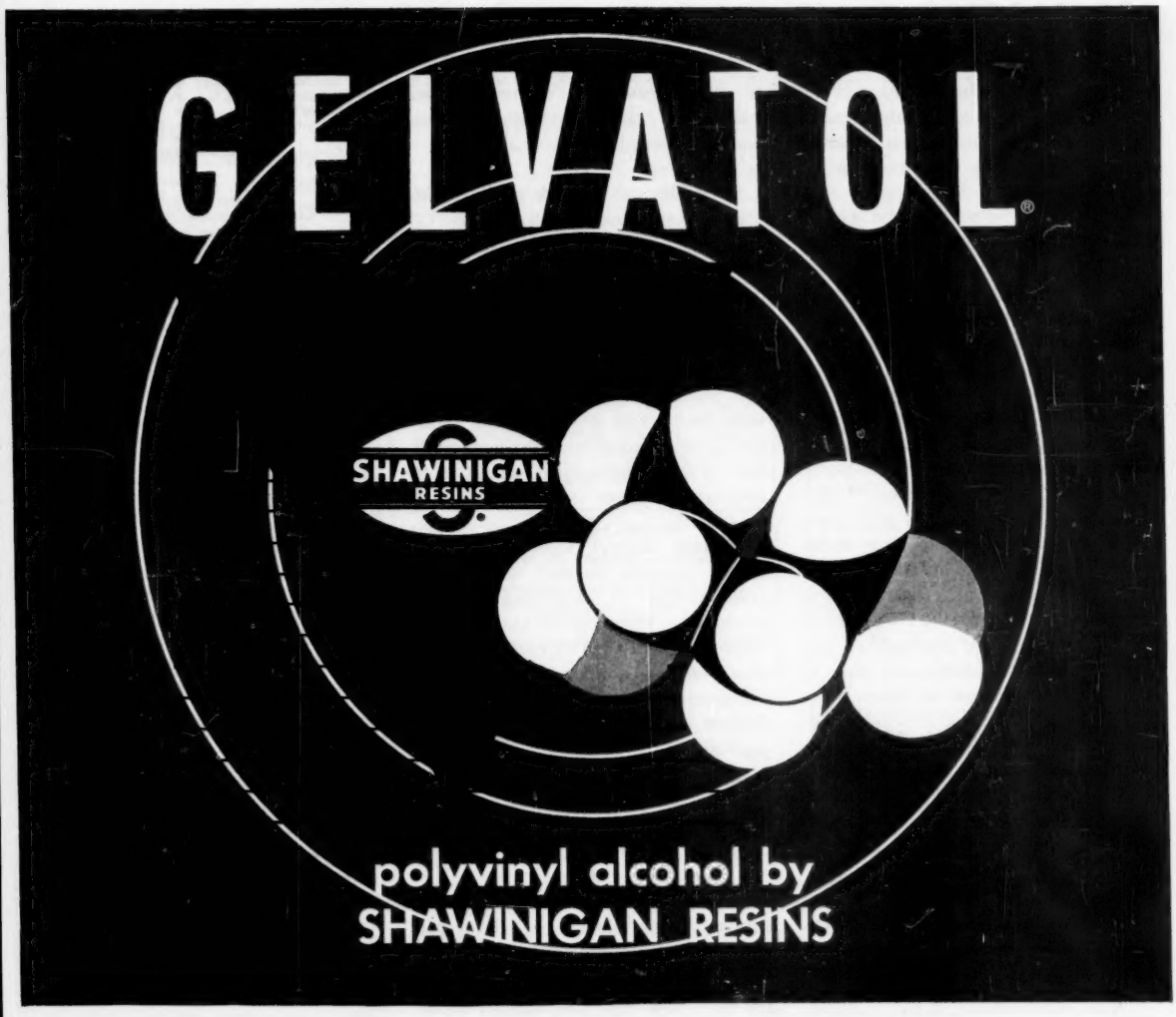
Max, Jr., a prominent cosmetics chemist, heads the research division of 40 chemists. Although research is centered in the company's new headquarters building in Hollywood, there is an overseas research program. Bulk of this work is in England, where investigations are performed for the firm's European divisions.

Tightening Up Control: To expedite new products from the research to the production stage, a new division, the Project Development Division, was recently set up. Besides being responsible for development of new products from conception through volume manufacture, the new division also originates and tests new packaging ideas. Final decision on acceptability of the new packaging ideas, however, is up to the finance committee.

Pointing for Production: The company manufactures its products in Hollywood, England, Canada, Mexico, France, Australia, Japan, Argentina and Cuba. To keep production at a fairly even level, the firm tries to spread promotion of new products throughout the year. It does no manufacturing for other companies.

Although Factor says that plant expansion to take care of increased production demands is largely complete, it still has facilities under construction in Paris and Mexico City, and additional office space abuilding in Hollywood.

Factor's foreign marketing operations are extensive; its products are marketed in more than 100 countries through department stores, drugstores



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and drug wholesale houses. The company won't say what percentage of its sales come from its foreign operations, comments only that foreign operations are "an important factor and will continue to be so."

To keep its place in the highly competitive cosmetics industry, Max Factor has had to spend more each year for advertising. At the start of '57, its ad budget was slated for $7 million; but during the year, it has been hiked to $9 million.

Bulk of the ad dollar is spent on television programs; it sponsors two network programs—the Guy Mitchell and Polly Bergen shows—plus spot commercials. Besides television, it also buys space in newspapers and consumer magazines, and a little radio time. As a result, Factor has become one of the largest advertisers in the West—and the largest in California.

Even though some segments of the chemical process industry are expecting a slight downturn in business in '58, Factor looks forward to increased sales gains—this year, the company exceeded its '56 projections for sales in '60. Despite the feelings of some observers that cosmetics are a luxury item and would be first to suffer in any recession, Factor says that this wasn't so in '29 and won't be so again because cosmetics have been accepted as necessities of life. In fact, it was in the '29 era, states Davis, that the firm made much of its initial growth.

And the company makes it clear that it's not against expanding further by acquisition, that it's looking around for likely mergers. Requirements are that prospects be in a related field, and in a sound position. If Factor follows its recent pattern, some acquisitions may well be on tap for the near future.

PRODUCTS

Paper Fiber: A new fiber—a chemically modified cotton linter pulp—is now being marketed by Virginia Cellulose Dept. of Hercules Powder Co. for use in high-strength fine papers.

•

Rubber Paste: Dow Corning has just introduced its silicone rubber adhesive—Silastic Adhesive S-2200. The solventless silicone rubber paste is claimed to develop strengths of 25 lbs. pull/in. width and to retain both mechanical strength and full resilience from —70 to 500 F. Designed to bond vulcanized silicone rubber parts, the translucent adhesive vulcanizes in five minutes at 260 F.

•

Seals Silicone Oils: A new fluorinated silicone compound for use as "O" rings and other pressure-type seals has been developed by Stillman Rubber and Development Laboratory (Culver City, Calif.). The new 70 SDH compound—called TH 1057—is said to be resistant to a variety of hard-to-seal fluids, air and fuel and air mixtures from —80 to 400 F. The product is also claimed to seal silicone oils and greases throughout an extreme temperature range.

•

Curtain Raiser: Gillette Laboratories, recently formed division of Gillette Co., is launching its first product — Thorexin — next month. Thorexin, a cough remedy with a cherry flavor, contains D-methorphan (dextromethorphan hydrobromide). Gillette says that its new cough suppressant is the first nonnarcotic antitussive agent that relieves coughing by suppressing the spasm reflex at the cough control center. Cost: $1.25 a carton.

•

Togetherness Trio: National Adhesives (New York) has developed three new laminating adhesives: Resyn 30-1246 for laminating metallized Mylar to calendered vinyl film; Resyn 36-6327 (a synthetic rubber-based lacquer) for laminating treated polyethylene to Mylar- (clear only) and saran-coated films; Resyn 36-6328 for laminating clear Mylar and metallized Mylar to themselves and to paper, foil to Mylar and to cellulose acetate butyrate.

•

Etching Process: Becco Chemical Division, Food Machinery and Chemical Corp. (Buffalo, N. Y.), has developed a new process for etching printing circuits. It employs as the etchant an aqueous solution of ammonium persulfate (instead of commonly used ferric chloride or chromic acid solution). No new equipment is needed to switch to the new process.

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Synthetic Perfume: Synthetic geraniol is now commercially available from Glidden Co. (Cleveland). Glidden says its product, synthesized from turpentine, has a minimum alcohol content of 98%.

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CHEMICAL WEEK • ADVERTISERS INDEX

December 28, 1957

ALLIED CHEMICAL & DYE CORP. NITROGEN DIV. 16
Agency—G. M. Basford Co.

AMERICAN CYANAMID CO. 47
Agency—Hazard Adv. Co.

AMERICAN MESSER CORP. 3rd Cover
Agency—Seberhagen Inc.

AMERICAN MINERAL SPIRITS CO. 55
Agency—Leo Burnett Co., Inc.

ARMOUR LABORATORIES, THE 72
Agency—Jordan-Sieber & Corbett, Inc.

BAKELITE CO. DIV. OF UNION CARBIDE CORP. 29
Agency—J. M. Mathes, Inc.

BARECO WAX CO. DIV. OF PETROLITE CORP. 72
Agency—Batz-Hodgson-Neuwoehner Adv.

BARNEBEY-CHENEY CO. 69
Agency—Byer & Bowman Adv. Agency

BAUSCH & LOMB OPTICAL CO. 94
Agency—Ed Wolff & Associates

BECCO CHEMICAL DIV. FOOD MACHINERY & CHEMICAL CORP. 74
Agency—John Mather Lupton, Inc.

BIRD MACHINE CO. 58
Agency—Walter B. Snow & Staff, Inc.

BLOCKSON CHEMICAL CO. 34
Agency—Wm. Balsam Adv.

CHEMICAL MFG. CO. 38
Agency—The House of J. Hayden Twiss

CROWN CORK & SEAL CO. 39
Agency—Aitkin-Kynett Co. Adv.

DAY CO., J. H. 23
Agency—Strauchen & McKim Adv.

DIXON CHEMICAL & RESEARCH INC. 67
Agency—Ray Ellis Adv.

DOWELL INC. 1
Agency—Rives, Dyke & Co., Adv.

DRAVO CORP. 91
Agency—Ketchum, MacLeod & Grove Inc.

DU PONT de NEMOURS & CO., E. I. GRASSELI DIV. 44
Agency—Batten, Barton, Durstine & Osborn, Inc.

DUREZ PLASTICS DIV. OF HOOKER ELECTROCHEMICAL CO. 36
Agency—Comstock & Co.

ESSO STANDARD OIL CO. 42
Agency—McCann-Erickson Inc.

EVANS RESEARCH & DEVELOPMENT CORP. 38
Agency—Ritter, Sanford & Price, Inc.

FISHER CHEMICAL CO., INC. 20
Agency—Freiwald & Coleman Co.

FLUOR CORP. 2
Agency—Hixson & Jorgensen, Inc.

FRITZSCHE BROS., INC. 69
Agency—Caleon Adv. Corp.

GAYLORD CONTAINER CORP. 50
Agency—Oakleigh R. French & Assoc., Inc.

GENERAL AMERICAN TRANSPORTATION CORP. TERMINAL DIV. 10
Agency—Edward H. Weiss & Co.

GENERAL AMERICAN TRANSPORTATION CORP. WIGGINS DIV. 57
Agency—Edward H. Weiss & Co.

GENERAL ELECTRIC CO. 8-9
Agency—G. M. Basford Co.

GRAVER TANK & MFG. CO. 61
Agency—Ladd, Southward & Bentley, Inc.

GULF OIL CORP. 83
Agency—Ketchum, MacLeod & Grove Inc.

HARSHAW CHEMICAL CO. 14

HEAVY MINERALS, INC. 46
Agency—Molesworth Assoc.

HERCULES POWDER CO. 12
Agency—Fuller & Smith & Ross, Inc.

INTERNATIONAL SALT CO., INC. 71
Agency—Batten, Barton, Durstine & Osborn Inc.

JEFFERSON CHEMICAL CO. 13
Agency—Hazard Adv. Agency

JONES & LAUGHLIN STEEL CORP. 52
Agency—Ketchum, MacLeod & Grove, Inc.

KELCO CO. 70
Agency—Cayton Inc. Adv.

KOPPERS CO. 68
Agency—Batten, Barton, Durstine & Osborn, Inc.

KRAFT BAG CORP. 73
Agency—Arthur A. Judson, Inc.

MAAS & CO., A R. 60
Agency—Heintz & Co., Inc.

MISSISSIPPI LIME CO. 40
Agency—Ridgway Adv. Co.

MUTUAL CHEMICAL DIV. ALLIED CHEMICAL & DYE CORP. 19
Agency—G. M. Basford Co.

NATIONAL ENGINEERING CO. 45
Agency—Russell T. Gray, Inc.

NORTON CO. 37
Agency—James Thomas Chirurg Co.

OXY-CATALYST INC. 41
Agency—Gray & Rogers Inc.

PATTERSON FOUNDRY & MACHINE CO., THE 63
Agency—Downing Ind. Adv., Inc.

PENNSYLVANIA REFINING CO. 62
Agency—Downing Ind. Adv., Inc.

QUAKER OATS CO., THE 80
Agency—Rogers & Smith Adv. Inc.

REICHHOLD CHEMICALS INC. 33
Agency—MacManus, John & Adams, Inc.

REYNOLDS METALS CO. 92
Agency—Clinton E. Frank, Inc.

RHODIA INC. 94
Agency—Sudler & Hennessey Inc.

RICHARDSON SCALE CO. 56
Agency—O. S. Tyson & Co., Inc.

ROHM & HAAS CO. 21
Agency—Arndt, Preston, Chapin, Lamb & Keen Inc.

SHAWINIGAN RESINS CORP. 95
Agency—Wilson, Haight, Welch & Grover Inc. Adv.

SHELL OIL CO. 11
Agency—J. Walter Thompson

SINCLAIR CHEMICALS, INC. 15
Agency—Morey, Humm & Warwick

SMITH CO., ARTHUR F. 30
Agency—Hanford & Greenfield, Inc.

SOLVAY PROCESS DIV. ALLIED CHEMICAL & DYE CORP. 2nd Cover
Agency—Atherton & Currier, Inc.

SOUTHERN STATES CONTAINERS DIV. REYNOLDS ALUMINUM SUPPLY CO. 48
Agency—George & Glover, Adv.

STEARNS ROGER MFG. CO. 51
Agency—Mosher, Reimer, Williamson Adv. Inc.

STONE & WEBSTER ENGINEERING CORP. 79
Agency—Harold Cabot & Co., Inc.

STRAN-STEEL CORP. DIV. OF NATIONAL STEEL CORP. 54
Agency—Campbell-Ewald Co.

TRUBEK LABORATORIES, INC., THE 24
Agency—Ray Ellis Advertising

UNION BAG-CAMP PAPER CORP. 22
Smith, Hagel & Knudsen, Inc.

UNION CARBIDE CHEMICALS CO. DIV. OF UNION CARBIDE CO. 53 4th cover
Agency—J. M. Mathes, Inc.

U. S. RUBBER CO. 64
Agency—Fletcher D. Richards Inc.

VIRGINIA-CAROLINA CHEMICAL CORP. 6-7
Agency—Albert Sidney Noble Adv.

VOGT MACHINE CO., HENRY 4-5
Agency—Farson, Huff & Northlich, Adv.

WILLIAMS & CO., C. K. 56
Agency—William A. Hatch, Inc.

tracers SECTION

(Classified Advertising)

F. J. Eberle, Business Mgr.

CHEMICALS: Offered/Wanted 97

EMPLOYMENT 97

EQUIPMENT: Used/Surplus New For Sale 97

WANTED 97

MANAGEMENT SERVICES 96

SPECIAL SERVICES 97

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Atlanta 3 Robert H. Powell 1301 Rhodes-Haverty Bldg., JAckson 3-6951

Boston 16 350 Park Square Building, Paul F. McPherson, HUbbard 2-7160

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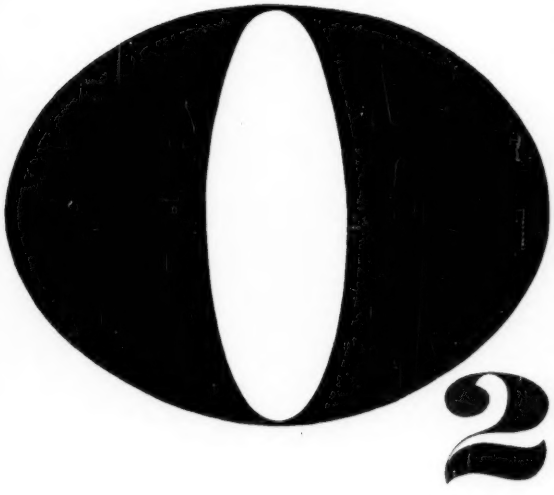

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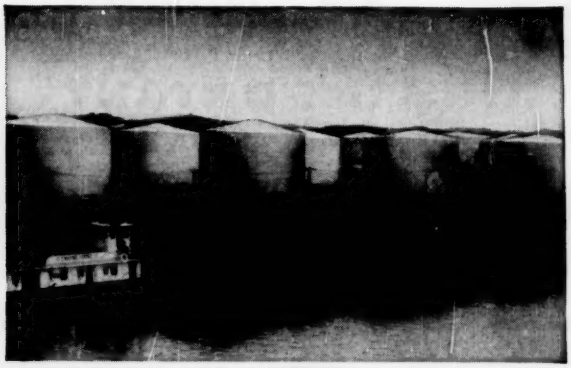

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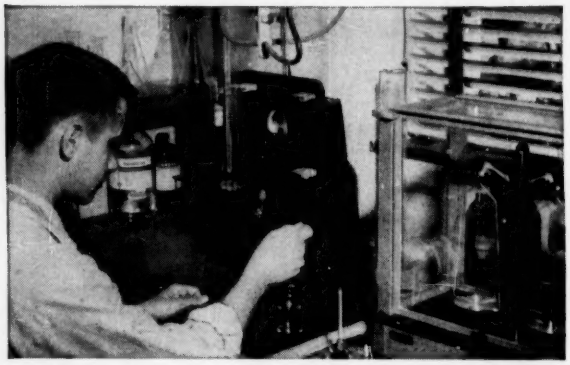

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